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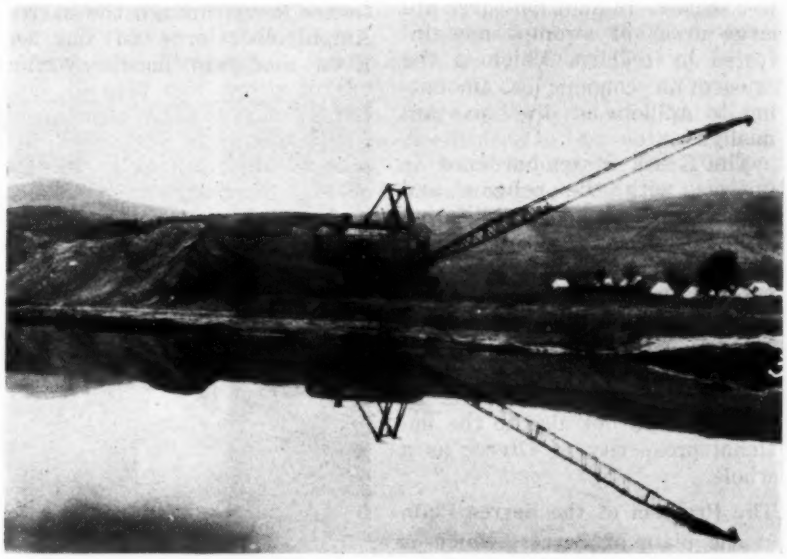
Reclamation of the Serres and Drama Plains in Greece

John Monks & Sons—Ulen & Company moving some 55,000,000 cubic yards to control rivers of Macedonia

by **D. W. TRIER**



On the new Struma channel this Bucyrus-Erie Class 200, the "Sidercastro", is rehandling the spoil pile from a previous cut.

STRANGE THINGS are happening along the ancient military highway, Via Egnatia, where the armies of Xerxes and Alexander the Great moved back and forth across Macedonia. In this famous region the Greek Government is carrying out a gigantic drainage, irrigation and flood control project. Construction activities to curb the Struma and Angista rivers have been proceeding since 1929, and vast areas in upper Greece will eventually be reclaimed for cultivation. The project is known as the "Struma Job," so named after the greater offender of the two rivers.

The work consists of two parts: reclamation of the plain of Serres which lies in the central part of eastern Macedonia about 40 miles northeast of Salonica and the reclamation of the Drama plain, about 40 miles east of the Serres plain.

A military road extends eastward from Salonica through Macedonia. During the World War this road was reconstructed and used to supply the Allied Armies. Many centuries ago, it formed a part of the Via Egnatia which led from Dyrrachium (Durazzo) to Byzantium (Constantinople). Troops of many nations and for many centuries have used it but today bodies of peaceful workmen accompanied by modern machines are passing along this road and its vicinity, engaged in a battle with Nature.

This road crosses the Struma river, described by Virgil as the place where Orpheus emerged from the underworld after losing his wife in Hades through his impatience. Thence the road passes over the Serres plain which was a battle front during the World War where many brave men on both sides gave up their lives to maintain the straggling lines of water-soaked and barbed-wire encircled trenches dotted with concrete machine-gun-nests, the ruins of which still remain. Passing through Serres, which existed as Sirhai or Siris at the time of Xerxes, the road crosses the hills where some of the finest cigarette tobacco is grown. Westward it skirts the plains of Philippi where in 42 B. C. a Roman army under Octavius and Antonious defeated another Roman army under Brutus and Cassius, the conspirators and murderers of Julius Caesar. Plainly seen from the road are the ruins of the ancient city of Philippi, where, in 65 A. D. the Apostle Paul established the first Christian community in Europe. The city

flourished until the fourteenth century, when it fell into ruin under the Turkish occupation.

390,000 acres in these plains practically worthless due to floods, drought, and malaria swamps.

The plains of the Struma district are highly suitable for the cultivation of wheat, corn, cotton and for agriculture in general, but require irrigation during the dry season and protection against inundation from floods during the wet season. In addition there are large areas of swamps now infested by malaria which is the cause of an economic loss amounting to millions of drachmas annually.

The Greek State, burdened as it was with the refugee and other important rehabilitation projects, deserves great praise for having, on October 28th, 1929, entered into a contract for the construction of the needed flood protection, drainage and irrigation works which will mean much not only to the inhabitants of these valleys but also to the national prosperity of Greece as a whole.

The Problem of the Serres Plain

The plain of Serres, which is about 31 miles long by 8 miles wide, is traversed by the Struma river which rises in Bulgaria, near Sofia, and flows out of Rupel Gorge into the plain. It has been estimated that this river discharges at times at the rate of 3000 M3/sec. It carries a large amount of silt. The bed, throughout the plain, is poorly defined and subject during flood periods to violent changes. At the lower end of the plain the river widens out and forms Lake Ahinos and it thence flows through the narrow Amphipolis Gorge to the sea. Even moderate floods overflow and inundate large areas. The large quantities of silt eroded by the river not only cause frequent changes in its channel but also great damage to the surrounding territory.

Neat houses on wheels make up this dragline camp on the Struma channel.

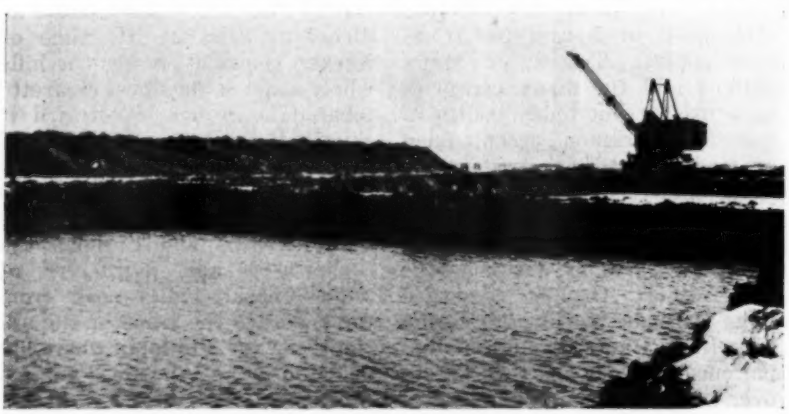
Sugar beets grown in the contractor's experimental garden at Petelinos.

A regulating reservoir above the plain, large enough not only to contain an entire season's flood but in addition to hold the accumulation of silt for many years could not be constructed on account of unsuitable topography. To carry the entire flood-flow to the sea through an adequate channel would not take care of the silt and construction of such a channel through the bed of Lake Ahinos would be extremely costly, if not impossible.

A compromise plan between these two methods was therefore adopted. It makes use of the natural depression of Lake Kerkinis as a partial regulating reservoir and will conduct the moderate size floods, resulting from this partial regulation, down to the sea. With this solution it is considered that all floods can be adequately controlled, and the entire bed of Lake Ahinos can be unwatered except for the portion through the center which will serve as a river channel. During the flood if, for instance, the water comes down at the rate of 3000 M3/sec. only 500 M3/sec. will be allowed to pass through the gates at the lower end and flow to the sea. During the time the water remains in the lake, it will deposit a large part, if not all, of the silt which it carries, so that practically clear water will flow through the remainder of the channel, thus eliminating the silt problem south of Lake Kerkinis.

How the plan is being accomplished

A broad channel about 900 metres (2953 feet) wide and capable of carrying a flood of 4000 M3/sec. is being constructed from Rupel Gorge to Lake Kerkinis. This channel which is south of and approximately parallel to the railroad, will be about 10 miles long and will carry the entire flood flow of the Struma. The em-



Bucyrus-Erie Class 2½ dragline building one of the dikes for the Struma Channel.

bankments are being constructed with a huge bucket-chain-excavator. The present area of Lake Kerkinis is being enlarged by constructing with draglines a strong earth embankment along the southeast side which will enable the water level to rise without flooding the plain below. Gates for controlling the flow will be placed at the outlet of the lake on the south side. Through these the water will flow into the present bed of the Struma. Embankments are being built by large draglines on either side of the present river down to Lake Ahinos and sufficiently far apart so that the channel may carry as much as 1200 M3/sec. without danger of overflow.

Two large hydraulic dredges are opening a wide shallow channel through Lake Ahinos with banks on either side which will carry the accumulated waters from the river and the surrounding side streams on a regular slope down to the mouth of the Amphipolis Gorge.

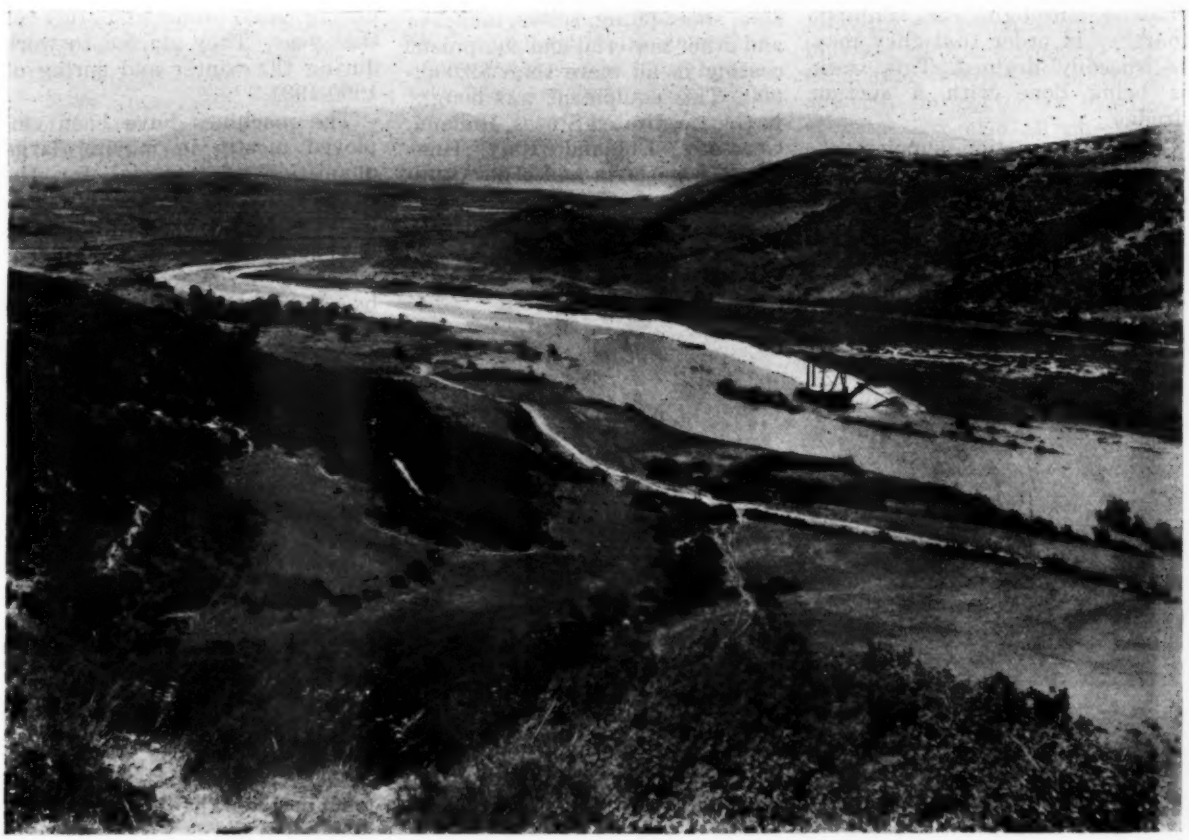
The gorge of Amphipolis, which is now too narrow and shallow to drain the lake is being widened and deepened from the lake to the sea with a dipper dredge.

The Problem of the Drama Plain

In addition to the above, which might be considered as the main project, there are many other works which are of almost equal importance. The entire plain is surrounded by mountains and during heavy rains, the water flowing off these mountains carries large quantities of gravel and rock which are deposited over and ruin vast areas of agricultural land. Provision is being made to hold this debris in the stream beds in the mountains and to canalize the clear water. To complete the drainage of the plain, numerous channels must be excavated and some of these will be large. Finally, provision must be made for irrigating practically the entire area and this will require an entirely separate set of canals.

The Drama plain, about 9 miles long by 9½ miles wide, slopes downwards to the south, the lower part known as the Philippi Marsh being entirely or partially inundated. The Angiti River and its principal branch, the Nevrokop, both rising in the mountains, north of the plain, join and flow out of the plain through a deep and narrow box canyon (Angista Gorge) into Lake Ahinos. The

Through this half mile tunnel the waters of the Angiti River will be diverted except in the rainy season when part of the flood will be carried off through Angiti Gorge.



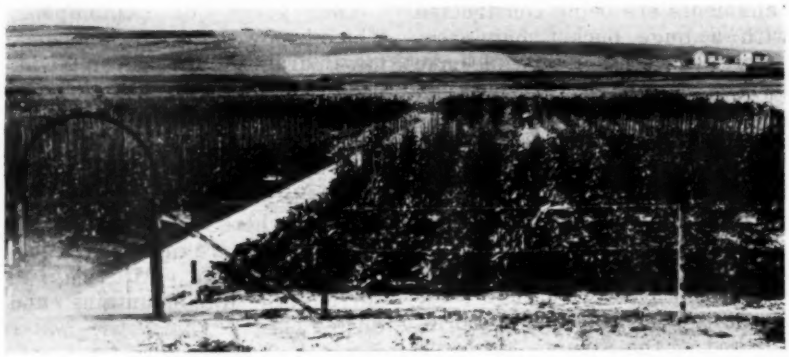
Dipper dredge "Angitis" deepening the channel through Amphipholis Gorge.

lip of this gorge is too high and its width too narrow to carry all of the water from the lower end of the plain and thus the marsh is formed.

As was the case in the Serres plain, a compromise solution has been adopted for reclaiming the Drama plain. A tunnel which will be deep enough to take care of any future subsidence of the plain is being driven about 500 feet north of and approximately parallel to the gorge. This tunnel, which will be a little over one-half mile long, will be large enough to take care of the entire flow from the plains during the eight or nine dry months of the year. During these dry seasons it will be readily possible to deepen the bottom of the gorge to take care of the surplus waters occurring during the flood seasons. Gates at the entrance will allow the water to be diverted either through tunnel or gorge, or divided between them.

As in Lake Ahinos on the Struma project, it will be necessary to excavate a broad, shallow channel through the Philippi marshes in order that they may be speedily drained. This work is being done with a suction dredge.

Torrent correction, supplementary drainage and irrigation also form a very important part of the complete solution of this problem.



The experimental garden maintained by Monks-Ulen at Petelinos.

Over two million dollars worth of equipment required

The Constructing Companies, acting as Agents for the Greek Government, have purchased for the project three large suction dredges, five large draglines with caterpillar-type mountings, several smaller machines of this type, a dipper dredge, a bucket-chain excavator travelling on rails, tractors, pontoons, pipes, steel sheet piling, scows, launches and other material and equipment costing in all more than $2,000,000. This equipment was bought in Greece, United States, Holland, Germany, England, Italy, Hungary, Yugoslavia and other countries. The five large draglines were supplied by the Bucyrus-Erie Company of South Milwaukee, Wisconsin. Two are Class 200 machines equipped with 137-foot booms and 4-cubic yard buckets. Three are Class 24's carrying 125-foot booms and 3-yard buckets. They are all Diesel-Electric powered with Atlas Imperial Diesel engines and General Electric and Westinghouse electrical equipment.

These machines were purchased in January 1930, and shipped during May, June and July of that year. They started to work during the winter and spring of 1930-1931.

The machines have been employed mostly in moving large quantities of material for the construction of low earth embankments. The material handled has been fine sand and silt of which a large percentage has been wet. Working conditions were exceedingly difficult because of high water in the winter and spring and also because of the wide areas over which the machines were being operated involving transportation of men and supplies across country for considerable distances with no adequate roads available.

For more than a year practically all machine operation has been done by Greeks trained on the job without previous experience in handling machinery and with excellent results.

The best record output during the past year, that is, July 1st, 1931 to August 1st, 1932, for all machines on the job, was made by the Bucyrus-Erie Class 200 dragline "Serres" which exca-

Class 200 Bucyrus-Erie dragline "Serres" at work downstream on the Kerkini Weir. This Bucyrus-Erie Class 200 holds the output record for the job.

vated 1,157,498 cubic meters (1,514,007 cubic yards). This performance was accomplished with a total fuel consumption of 311,479 kilograms of Diesel oil, or 0.27 kilograms per cubic meter, a job record for low fuel consumption.

Project to cost twenty-one million . . . totals some 54,936,000 yards

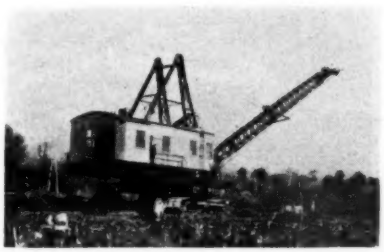
The total cost of the works in both plains is estimated at about $21,000,000 including General Expense and the Contracting Companies' Fee.

The volume of excavation is estimated at 42,000,000 M3 (54,936,000 cubic yards) as a minimum, or sufficient material to form a belt around the equator 2 meters wide and one-half meter thick.

The areas which will benefit from the works are the following:

	*Stremmas
Area not subject to flood	657,525
Area periodically flooded	325,700
Area waterlogged	169,992
Area marshes and lakes	406,783
Total area in the districts of the works	1,560,000

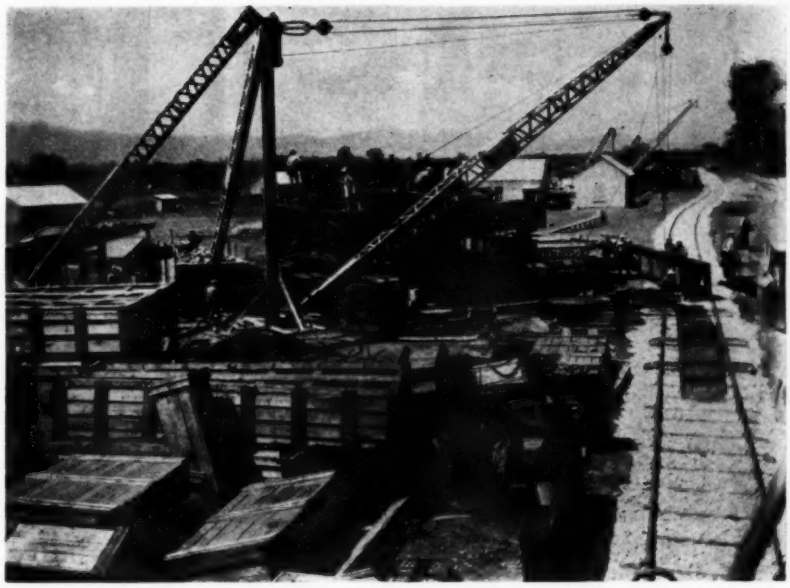
Of the above area, 776,000 stremmas will be irrigated and another 96,000 stremmas will be occupied by the works.



Dragline "Vyronia", a Bucyrus-Erie Class 24, moving in on a protective embankment job near Mandraki.

Aside from sanitary and subsidiary benefits which will accrue from the works, it is conservatively estimated that the value of the land in the district of the works will increase by at least $50,000,000 or more than double the cost required for construction.

*A Stremma equals approximately one quarter of an acre.



Erecting one of the Bucyrus-Erie Class 200s at headquarters camp.

Taking Care of the Workmen

For housing the laborers and the Company's personnel, 150 wooden or steel buildings, including workshops and storehouses, have been constructed, of which the ones inhabited are lined on the inside with a special insulating material. A force of more than 2800 men were employed every day during the busy months.

Hospitals with 36 beds each, as well as smaller hospitals adjacent to them with two beds each for contagious diseases have been constructed at the Vyronia and Petelinos camps. A third similar hospital was constructed at the entrance to the Angista gorge. Other smaller hospitals 10-16 beds each, are provided for the camps of the Kerkini and Couvoukli dams as well as for the Amphipolis gorge.

The Organizations Putting Through this Great Project

Everything possible has been done to protect the workmen and provide for them the most sanitary living conditions. The Companies are particularly pleased with the results to date in combating malaria. During the worst month the percentage of personnel suffering with malaria has not exceeded four per cent.

The entire work is being carried out by the Companies of John Monks & Son — Ulen & Company under the control of the Ministry of Communications. Not only are all of the accounts of the Companies subjected to the inspection and control of the Government but also all purchases, plans and construction are subject to full Government control.

Colonel Roy W. Gausmann is General Manager for the Constructing Companies in charge of all operations. Associated with him are a number of long experienced engineers, accountants and skilled men from both Companies who are putting forth every effort to complete these Reclamation Works in Greece as quickly as possible and in a manner that will accomplish the desired results efficiently and economically.

Sweet Young Thing: "I suppose you've been on the water so long you're accustomed to sea legs."

Old Captain: "Lady, I wasn't even looking."

The American Mining Congress holds the 10th Annual Convention of Practical Coal Operating Men and a National Exposition of Coal Mining Equipment at Pittsburgh on May 8th to 12th, 1933.

Ready to start on the afternoon's tussle with mountain landscape.

by **NINA LANE**

Tractors play leading roles in difficult road building for fire protection in Mount Hood National Forest

Cutting through Forest Service roads

FIRE PROTECTION ROADS in Oregon are seemingly built over night. The new road being built by the United States Forest Service, in the Mt. Hood National Forest is no exception. This is the new road from Summit Ranger Station on the Mt. Hood Loop Highway to Devil's Peak Lookout Station; a twelve-foot dirt tread.

Construction Foreman Carl Alt, who has built more miles of road than any other man in this section, having been on the job for fourteen years, is in charge of the work. The engineer on the job is C. W. Gowan from the district office in Portland. So experienced are these men in building roads through the rugged mountains that a costly survey is unnecessary. An Abney hand level or clinometer being the only instrument used to hold the grade to approximately ten per cent.

This Devil's Peak road traverses one of the roughest portions of the Cascade Mountains in the Northwest and, Mr. Gowan informs me the dirt is being moved at astonishingly low figures of less than seven cents a cubic yard.

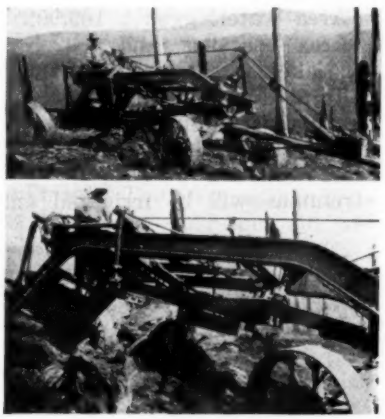
Caterpillar and Cletrac Nitch Road Into 12-miles of Rugged Mountain Side

A Sixty Caterpillar gas-driven tractor, persuades a Sixty Leaning Wheel Grader, built by Caterpillar, to follow it along the side of the mountains over stumps, boulders, shale-rock and loam, where to get traction would be utterly impossible with any other type of machine. The trail is being broken by a Fifty-five Cletrac with a Woolridge trail builder with William Wilson at the controls.

From many points along this road one can gaze far out over Mud Creek and Salmon River canyons to Frog Lake Butte. There another road built by this same outfit winds its way to the lofty summit of the Butte. Still another road of this type and constructed by the same method leaves the Mt. Hood Loop Highway at Government Camp elevation four thousand feet above sea level and terminates at the timberline on Mt. Hood, elevation six thousand feet.

The Devil's Peak Road when completed will be twelve miles long. For the most part, it follows the old pack trail over a burned section where logs and trees have fallen in an almost impenetrable mass. But this debris seems to be no obstacle at all for the Cletrac with its bulldozer.

I rode into the job with D. P. Faubion, a hydrographic engineer, and a friend, over the first two miles of finished road, in the first private car to go into this closed area. From there we walked over a mile of the softest dirt and the hardest rocks that ever formed a road-bed, until we came upon the Caterpillar and grader getting tuned up for the afternoon work.



Broken rock, stumps, tree trunks, just plain dirt . . . they all go over the side when this sturdy Caterpillar Sixty takes hold.

The Author Takes a Ride

J. E. Sinclair who handles the big Sixty with the ease of a lady driving to an afternoon tea in her coupe, asked me if I would like to take a ride up the mountain. As this would be my first tractor ride I gladly accepted the invitation, and while I am not sorry, I feel that I will be able to live long

years without another — the thrills will linger in memory, I am sure.

We, meaning the Caterpillar, the grader, Mr. Sinclair and Virgil Mayfield (who manipulated the controls of the grader in a masterful manner), and I, started off over the narrow trail broken by the Cletrac, with jolts, bumps, rises and falls, not to mention slides and slips. This was new road for the Cat, and it was rough, narrow and full of rocks, boulders, stumps and open air. The air was on the fill side which

Breaking trail with the Cletrac.

dropped away down the mountain side to the bed of Mud Lake. Often there was no traction on the fill side and both the Cat and grader had their tails in the air. It was most exciting. They needed no sign warning one not to talk to the operator. I was too busy hanging on and he was occupied with maneuvering to dig the first few inches into the mountain side and watching the eccentricities of the grader behind.

Once we slipped and seemed to be hanging so far over nothingness on the fill side, that I asked if there was any danger of rolling over. The operator informed me that "it slides on shale rock." So would anything slide at that angle, shale rock or solid concrete if it was not glued on. Another few feet and again we were in the air on the fill side. Again I expressed a fear of turning over. Mr. Sinclair looked at me with a patient expression and remarked that he had yet his first time to turn over and added, "It just slips." As an afterthought he remarked that he had been handling Caterpillars since 1921. This rather squelched but did not humiliate me. Once we stopped in front of a huge fir stump that had evidently had a good drubbing by the Cletrac and he asked the foreman, Mr. Alt if he should take the other side of it. I had visions of more air work and slides but nothing much happened except that the huge grader caught the stump and pulled it along until the blade set at sufficient angle, then heaved it over the grade and out of the way forever. While this was doing the tail was in the air again and the Cat was hanging over the mountain on the fill side. The only remark made was by Mr. Sinclair and that was: "It takes good machinery to stand that." We chugged and chooed and reared and slipped along for another few yards until the six-ton blade caught a huge boulder, rolled it for a few feet and then we stopped. The greater part of the grader was in the air on the down hill side. "She is almost over—have to lengthen line." This was done from one of the drums at-

Cletrac and Woolridge smashing through the beginning of the road.

Nothing, and lots of it, just over the edge.

tached to the rear of the Caterpillar. This valuable accessory consists of donkey-type main line and haul-back drums equipped with Timken bearings and put out by the Willamette-Ersted Co. of Portland, Ore. and Peoria, Ill. It is built for light logging though put to many other uses. Soon the grader was on solid ground again. I was told with great pride that it had never gone clear over although she was often down on the lower side. While the line was being let out from the drums I took the opportunity of dismounting by climbing over the gas tank, having ridden a half mile.

38 Miles of Road Building, 300 Miles of Maintenance—No Repairs Needed

Through two seasons of this kind of work the Caterpillar has never been in need of repair. The valves were ground this year for the first time. Last year she built twenty-six miles of new road, and will have built twelve miles this year before the season closes. Last year she did two hundred miles of maintenance work and this year one hundred miles with more to do after this job is completed. The average consumption of oil is five gallons a week and the gasoline average is twenty-one gallons a day, working an eight-hour shift. The engineers and everyone concerned are enthusiastic over the work of the Caterpillar. She is doing her share of the dirt moving at a cost of three cents a cubic yard.

A mile farther up the mountain the little 55 Cletrac with Woolridge trail builder was butting over trees, pushing and pulling logs out of the way, climbing over stumps and boulders, backing,

(Continued on page 159)

Versatile Shovel *rips up pavement, pulls stumps and* EVEN LIGHTS GAS

Brugel Contracting Company's GA-3 displays all-around ability, both as digging machine and odd job worker

by SPENCER A. JONES

DIGGING up miles of street pavement in the New York City boroughs of Brooklyn, Kings and Queens is the regular, everyday job of a Bucyrus-Erie GA-3, owned by the Brugel Contracting Company, Inc., Ridgewood, N. Y. Almost every material of which street pavement can be constructed is encountered, including granite blocks, earth, cinders, concrete and asphalt.

In addition, Bill Vandewater, the operator uses it to pull

Up she comes. A load in itself, to say nothing of having to pull the stump out by the roots.

stumps, haul mired trucks out of the mud, and even to light the gas—yes, and to extinguish the gas, too.

Gus Brugel and Tom Bernhardt, respectively president and treasurer of the Brugel Contracting Company, were getting such satisfactory service from a 1-yard GA-2 which they have owned for the past four years, that they bought the GA-3 in April, 1932, when business began to pick up. Their work consists entirely of the removal of old highway pavement and the preparation of the grade, ready for the construction of new pavement, and practically all of their operations are for the City of New York's Bureau of Highways.

Typical jobs are: Three blocks of earth excavation along 120th Street, Queens, from 111th Ave. to 114th Ave., the cuts varying from 6″ to 3′-0″ deep by about 35′-0″ wide. Seven blocks along Blake Ave., Brooklyn, from Hopkinson Ave. to Grafton St., stripping 6″ concrete base and 3″ asphalt top, 40 feet wide, and extending to the building line at street intersections. Several blocks along Livonia Ave., Kings, from Pennsylvania Ave. to New Jersey Ave., and from Miller Ave. to Van Siclen Ave. stripping old granite block pavement 34 feet wide in tight quarters underneath an elevated railway structure. Several blocks along No. Hempstead Turnpike, Queens, from Fresh Meadow Road to Nassau Boulevard, stripping asphalt and a 1½″ crushed stone base 23 feet wide, including the trimming of dirt shoulders 4 feet back on each side. This last job was handled at the rate of 100 linear feet per hour or better.

The photographer found the GA-3, after much searching, at 43rd Ave., Queens, between 74th and 76th Streets, doing some street grading in earth, and pulling stumps at odd moments. Bill Vandewater, smoking his cigar, and Fred Knoblich, the oiler, were busy as bird dogs, but they answered a few questions as opportunity offered.

Question: How do you move the shovel from job to job?

Answer: Any move of a mile or less is made under its own power. Longer moves are made on a trailer.

Bill Vandewater, operator of Brugel Contracting Company's GA-3, with his cigar. He rips up any kind of pavement, pulls stumps, and even lights the gas and extinguishes it with his trusty shovel. Note the low overhead wires.

Question: Do you have any trouble getting under low overhead wires?

Answer: No. I can get under any wire the cab can get under, and that's only about 11′-6″ high.

Question: Is the shovel busy most of the time?

Answer: Been working every day, except Sundays and holidays, since April, 1932.

Question: How about repair bills?

Answer: Haven't had any, except for worn out dipper teeth and hoist cables.

Question: How do you like this GA-3?

Answer: O. K.

Question: Why?

Answer: Hey, who the heck are you, anyway?

Question: I work for the Excavating Engineer.

Answer: Is that so? Well, you tell those Bucyrus-Erie fellows to put some hooks inside this steel cab. I got no place to hang my coat.

Question: All right. Now, why do you like the GA-3?

Answer: For one thing, she

don't shake the liver out of me. The compressed air engines on the crowd and swing kind of cushion the jolts. For another thing, I can crowd and hoist at the same time, and I got plenty of power for both. She's a fast working little devil. Chase those kids out of the way, Fred.

Question: How does she handle when you're moving around?

Answer: Like a flivver roadster, only a flivver can't jump ditches like this rig. Hey! Where do you think you're going with that truck?

Question: Ever do anything unusual that I can write about?

Answer: (by Fred, the oiler) Sure, he lights the gas with her.

Question: No foolin'?

Answer: (by Fred, again) Yep, he was grading next to a trench where there was a leaky gas pipe. His dipper teeth struck a spark off some rock and touched off the gas.

Question: What happened then?

Brugel Contracting Company's GA-3 ripping up pavement in Queens County

Answer: (still by Fred) He just got a dipperful of earth and dumped it on the flame and put it out, didn't you?

Question: How about it, Bill?

Answer: Aw, boloney!

Question: How about taking some pictures?

Answer: All right, only I can't stop for you. I got work to do. Hey, you, don't spot that truck over in Jersey. Bring it over closer. Think this boom is a mile long?

Anyway, here are the pictures, including Bill, with his big cigar, pulling stumps with his gas-lighting GA-3.

Current Status of Federal-Aid Road Construction

U. S. BUREAU OF PUBLIC ROADS — AS OF FEBRUARY 28.

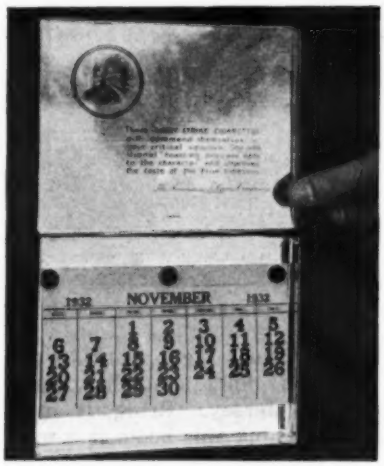
(See article page 160.)

STATE	COMPLETED MILEAGE	UNDER CONSTRUCTION						APPROVED FOR CONSTRUCTION					BALANCE OF FEDERAL AID FUNDS AVAILABLE FOR NEW PROJECTS	STATE
		Estimated total cost	Federal aid allotted	Percentage completed	MILEAGE Initial	MILEAGE Stage*	MILEAGE Total	Estimated total cost	Federal aid allotted	MILEAGE Initial	MILEAGE Stage*	MILEAGE Total		
Alabama	2,397.8	$ 4,899,898.25	$ 2,429,999.08	52	195.1	80.0	275.1	$ 866,276.17	$ 433,138.06	11.9	28.1	40.0	$ 3,273,285.46	Alabama
Arizona	1,271.9	2,793,510.18	1,197,593.53	64	107.8	151.7	259.5	18,684.38	5,736.46	3.2		3.2	117,913.53	Arizona
Arkansas	1,930.5	4,006,789.77	1,890,077.95	57	95.5	61.5	157.0	1,151,280.60	575,640.81	91.6		91.6	1,898,475.14	Arkansas
California	2,460.2	9,218,291.90	2,588,267.04	69	161.8	38.6	201.4	1,759,707.13	170,764.11	53.8		53.8	63,614.88	California
Colorado	1,782.4	3,038,039.61	1,362,561.88	57	115.8	34.0	149.8	776,944.26	399,684.63	52.3		52.3	996,735.72	Colorado
Connecticut	891.7	4,570,893.52	1,859,809.50	63	51.5		51.5	197,042.80	43,599.50	2.5		2.5	66,931.08	Connecticut
Delaware	388.7	675,082.15	175,212.72	56	18.6	71.9	90.5	244,671.10	53,012.72	10.4		10.4		Delaware
Florida	661.0	6,040,733.90	2,886,289.70	58	144.1		144.1	468,406.35	199,282.17	.8		.8	1,072,993.91	Florida
Georgia	3,152.5	6,869,808.42	2,948,736.18	59	172.7	198.5	371.2	706,501.14	93,060.53	3.7	11.0	14.7	28,687.83	Georgia
Idaho	1,531.0	2,705,139.03	1,032,983.28	67	171.9	130.6	252.5	733,569.15	83,413.50	18.0		18.0	87,609.68	Idaho
Illinois	3,068.8	21,187,967.74	8,213,217.18	79	650.9	38.2	688.6	1,178,988.89	487,319.49	44.1		44.1	20,310.48	Illinois
Indiana	2,064.7	7,331,746.19	3,300,118.69	89	270.6		270.6	2,983,461.38	759,598.38	117.1	5.3	122.4	475,284.26	Indiana
Iowa	3,515.5	5,713,853.68	1,005,785.38	67	286.1	40.0	326.1	29,981.52	11,160.00		1.2	1.2	18,502.48	Iowa
Kansas	3,808.8	4,593,180.00	1,666,371.55	70	293.6	113.9	407.5	1,375,844.95	296,009.42	81.1	25.8	106.9	867,408.59	Kansas
Kentucky	1,884.5	4,779,875.36	1,717,740.89	53	208.3	118.8	327.1	5,128.59	2,564.00				153,737.29	Kentucky
Louisiana	1,609.7	7,384,353.36	3,211,146.73	69	95.1	86.3	81.4							Louisiana
Maine	816.9	2,521,995.17	1,007,040.95	67	75.3	5.3	80.6	92,657.35	30,883.45	.2	1.9	2.1	83,173.46	Maine
Maryland	497.5	1,434,599.58	466,992.53	86	65.7	2.5	68.2	359,830.40	89,060.00	7.3		7.3	35,778.68	Maryland
Massachusetts	870.3	4,305,603.05	1,085,719.88	58	59.8	4.9	64.7	158,306.29	30,000.00	3.4		3.4	30,738.38	Massachusetts
Michigan	2,893.8	7,391,967.13	2,982,624.95	65	311.5	103.0	414.5	1,158,375.91	396,990.00	66.4	1.4	70.8	53,952.76	Michigan
Minnesota	4,388.6	4,645,947.47	133,628.91	84	149.7	139.4	289.1	114,649.87	100.00	1.3	.4	1.7	81,595.43	Minnesota
Mississippi	1,823.9	6,610,274.64	3,861,335.81	55	226.3	78.9	305.2	915,350.51	257,675.87	17.7	8.5	20.2	3,200,866.41	Mississippi
Missouri	3,187.8	3,009,002.58	632,312.18	70	129.2	11.0	140.2	2,052,198.31	371,194.71	103.7		103.7	185,115.26	Missouri
Montana	2,730.8	6,930,367.56	3,880,467.85	57	508.3	288.2	796.5	666,048.38	379,331.29	78.6	11.8	90.4	731,482.58	Montana
Nebraska	4,868.3	5,769,048.69	2,713,858.06	43	165.6	136.7	302.3	169,336.37	76,269.76	10.8	2.4	12.8	737,279.76	Nebraska
Nevada	1,353.3	1,566,696.03	619,207.81	84	28.7	106.9	135.6	482,562.12	14,835.12	29.6	13.0	42.6	129,455.26	Nevada
New Hampshire	934.8	795,156.31	336,481.31	69	20.7	3.4	24.1	194,280.17	57,712.07	1.4	.6	2.0	90,145.54	New Hampshire
New Jersey	629.2	6,215,531.90	2,132,866.80	65	54.3		54.3						66,278.22	New Jersey
New Mexico	2,868.8	2,765,699.43	1,211,028.87	65	161.5	77.8	239.3	569,300.04	238,044.57	15.4	13.0	28.4	104,379.99	New Mexico
New York	3,987.0	17,395,729.40	5,403,116.75	65	466.7	28.4	495.1	2,333,150.65	806,790.00	46.5	3.6	50.1		New York
North Carolina	2,529.3	4,333,366.04	2,163,071.83	60	147.3	23.6	210.9	918,787.67	460,853.86	131.8	.5	132.3	1,370,711.81	North Carolina
North Dakota	5,277.3	4,405,508.33	1,866,139.77	53	376.5	383.7	760.2	917,193.31	297,291.16	64.7	253.2	317.9	893,980.19	North Dakota
Ohio	2,999.3	8,955,588.09	2,471,933.49	70	203.5	69.8	273.3	1,118,368.00	321,795.27	26.2	6.3	30.5	98,175.09	Ohio
Oklahoma	2,436.3	3,889,205.46	1,675,825.51	74	158.3	65.2	223.5	2,436,370.92	502,649.34	166.2	18.3	183.2	369,692.89	Oklahoma
Oregon	1,985.3	3,972,568.18	1,635,160.08	68	115.7	94.2	210.2	861,138.58	170,712.78	14.2	.4	14.6	87,857.71	Oregon
Pennsylvania	3,186.9	11,995,708.34	3,980,000.53	55	455.3	36.0	491.3	771,311.27	294,795.43	25.0		25.0	36,752.89	Pennsylvania
Rhode Island	271.6	1,071,153.47	361,357.87	69	22.5	4.5	27.0						31,598.36	Rhode Island
South Carolina	1,957.4	3,515,090.79	1,326,892.73	57	162.5	156.1	320.6	77,298.09	10,787.67		3.4	3.4	299.17	South Carolina
South Dakota	4,296.2	3,570,083.59	1,609,619.10	76	299.7	203.5	463.2	167,351.17	40,466.93	33.7		33.7	69,951.50	South Dakota
Tennessee	1,606.7	5,179,156.96	2,588,857.51	74	163.6	61.6	225.2	399,222.62	197,111.30	14.0	5.7	19.7	560,086.44	Tennessee
Texas	7,806.7	18,592,566.15	7,269,032.58	61	738.0	475.1	1,213.1	3,191,700.82	852,048.75	187.2	87.1	274.3		Texas
Utah	1,729.6	1,687,737.52	696,942.06	38	36.9	77.9	114.8	251,885.56	106,099.29	27.0	15.5	42.5	205,033.73	Utah
Vermont	385.8	508,094.30	26,750.89	60	26.6		26.6						16,037.73	Vermont
Virginia	1,558.8	4,637,691.97	2,005,898.12	64	216.6	53.1	269.7	725,787.16	362,723.48	29.5	17.4	46.9	185,219.81	Virginia
Washington	1,331.3	2,958,353.87	787,648.10	44	100.9	1.1	102.0	814,477.77	187,108.00	16.7	8.9	25.6	79,898.34	Washington
West Virginia	913.0	3,598,736.97	1,450,958.71	67	185.0	8.5	133.5	109,186.87	45,566.87	.2		.2	44,891.79	West Virginia
Wisconsin	2,764.2	6,130,555.58	1,186,806.56	75	179.3	182.0	361.3	92,061.50	26,500.00	.1	.9	1.0	153,605.97	Wisconsin
Wyoming	2,062.4	3,163,889.56	1,126,760.50	61	265.1	178.2	443.3	709,476.10	29,588.60	39.0	14.5	53.5	26,050.37	Wyoming
Hawaii	78.4	2,316,038.52	1,238,598.23	50	62.3		62.3	106,527.76	106,527.76	3.7		3.7	745,360.73	Hawaii
TOTALS	105,911.6	260,189,900.39	97,337,857.89	61	9,294.7	4,011.1	13,560.8	33,093,698.17	9,815,842.78	1,699.6	528.1	2,217.7	15,745,966.99	TOTALS
Construction completed		148,060,000	59,497,000											
Balance uncompleted		116,129,000	37,840,000											

*The term stage construction refers to additional work done on projects previously improved with Federal aid. In general, such additional work consists of the construction of a surface of higher type than was provided in the initial improvement.

FIELD NOTES

Handy Container or Holder for Small Calendars



THE small month and numeral sheets of advertising calendars commonly removed and tacked up at some convenient place in the cab soon become curled up and dirty. Various unhandy and unsightly things are often used to cover and protect them. Take one of the thin flat tin cigarette boxes. Tack it and the calendar up as shown. It is just large enough and small enough for any of the handy small calendars so used. The box is thin, neat, never in the way, yet the cover is always snugly down over the pad only when lifted for inspection. A calendar so fixed will remain clean, clear and straight the entire year.

Frank W. Bentley, Jr.

Excavator's Liability for Injury to Adjacent Property

TIMELY notice of intent to excavate and the doing of the work with reasonable care leave an owner of land free from responsibility for weakening of the wall of a building on an adjacent lot. This rule of law was reaffirmed by the Nebraska Supreme Court in the recent case of Resnick v. Kazakes, 240 N. W. 585. The court said:

"It clearly devolved upon the defendant to provide the proper support for his building where timely notice of the plaintiff's intention to excavate for a building on the adjoining lot was given. And the plaintiffs are not liable in damages to the defendant for the alleged weakening of the walls of the defendant's building where it is shown that the plaintiffs used due care in their excavation."

But it is to be remembered that the courts generally make a distinction between the duty of an excavator to support *improvements* on adjacent land and his duty to support the *soil* in its natural condition. That distinction was involved in another recent case—Diksajtsz v. Brosz, 158 Atl. 620. In that case, the Pennsylvania Supreme Court decided that if an excavating contractor failed to use reasonable care in shoring up the soil of the adjacent lot, and the consequent subsidence of the soil weakened the walls of a building on that lot, the contractor could be held liable. The court said:

"For an injury to buildings, which is unavoidably incident to the depression or slide of the soil on which they stand, caused by an excavation on adjoining land, an action can be maintained when a want of due care or skill, or positive negligence, has contributed to produce it."

However, in the Pennsylvania case, the court set aside judgment in favor of the adjacent owner and ordered a new trial, on the grounds that the trial judge erred in letting the jury understand that the contractor was liable if he failed to use a customary method of shoring, and in letting the jury consider the fact that the contract between the owner and the contractor required the latter to make good any damage done to adjacent property. The court reiterated the proposition that the mere fact that a contractor does not use customary appliances in doing his work is not evidence of negligence. On the second point, the court said that the contract between the owner and the contractor, being intended only to fix their mutual rights and liabilities, could not confer rights upon the adjacent owner or other third parties.

The legal principles above discussed are rules of the common law—applicable only where there is not a conflicting statute or ordinance expressly defining the excavator's duties. So, in still another recent case — McDaniel Brothers v. Wilson, 45 S. W. 2d, 293—the Texas Court of Civil Appeals recognized that an ordinance imposed upon an excavating owner and contractors an absolute duty to support the foundation of an adjacent building. The court said:

"Because of the harshness of the common-law rule, and the injustice flowing from its application, the Legislatures of many states and the city councils of many cities have provided strict building regulations for the protection of adjoining property owners."

But, here again, the excavating contractors won a temporary victory, at least. Judgment against them was set aside and a new trial awarded, because the trial judge erred in instructing the jury as to the measure of damages recoverable by the adjacent owner. One of these instructions permitted the jury to allow the adjacent owner reasonable expenses incurred by him in repairing his building, without regard to whether or not such expenses were rendered *necessary* through the contractors' fault.

—A. L. H. Street,
Attorney-at-Law.

Now That Beer is Back

DURING the warm days someone is occasionally kind enough to bring around refreshments, and only too often there will not be a pocket cap remover on a single man in a crew of fifty. Quickly make a very good and efficient one as shown above. Simply bend over a 6d or an 8d nail and wedge it between the claws and on the hammer. Makes a cap remover as practical, safe and efficient as you could wish for.

—Frank W. Bentley, Jr.

EQUIPMENT
You Ought to Know About

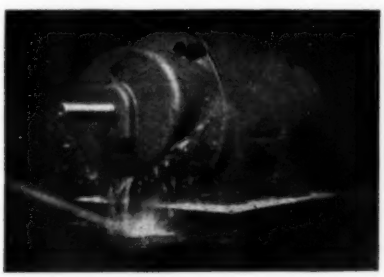
Largest Walking Dragline Ever Built

THE demand for a dependable excavator with bigger-bucket capacity, longer boom reach, more rapid digging, swinging and dumping, and greater flexibility in maneuvering has resulted in the development by the Bucyrus-Monighan Company of a new 10-yard walking dragline with 160 foot boom. This new model is the largest walking dragline ever built and combines the advantages of long reach and big bucket capacity with the exclusive advantages of walking traction. It is now possible to get the larger capacity and larger yardages desired in a machine which is not hindered or delayed by soft ground, rainy weather, rough footing or obstructions in the path of the machine.

The 10-W is greatly strengthened throughout to meet the much higher stresses imposed by handling such a large bucket on a long boom. The operator's cab has been elevated high up in the front right-hand corner, giving the operator an unobstructed view. The walking traction operates just as smoothly and is just as easily controlled as on the smallest Bucyrus-Monighan Walker. The shoes are raised high above the ground while the machine is excavating, during which time it rests on an independent circular base of large area. The shoes, elevated above the ground, are pointed in the direction it is desired to move, the walking mechanism starts operating and the machine moves off in a direct straight line toward the desired position. This enables the machine to angle around boulders, to take a zig-zag path to follow the work, to side-step obstructions, to step directly away from a slide or mud hole, and to dig excavations wider than its boom reach.

Bucyrus-Monighan Walking Draglines are sold by *Bucyrus-Erie Company, Department LA-5, South Milwaukee, Wis.*

Splash Proof Motor



THE Louis Allis Company has recently perfected what they believe will prove to be one of the most original and outstanding motor developments of recent years — the first Splash-Proof motor, capable of preventing entrance of water splashed with terrific pressure from any angle. Heretofore common practice has been to install open motors with sheet metal covers which seriously restrict ventilation. Other fully enclosed motors have proven unsatisfactory because they trap moisture resulting in condensation and breakdown.

The new L-A Splash-Proof motor is provided with a double baffle in an elliptical-shaped air passage in each endbell. This unique and original construction, permits free passage of ventilating air, traps and drains water splashed into the air opening at the bottom of the elliptical-shaped chambers. Aside from these air openings the motor is fully enclosed. For additional information please write *The Louis Allis Company, Milwaukee, Wisconsin,* mentioning this magazine.

Portable Sump Pump

A NEW portable, air-operated sump pump intended for use by mines, refineries, general contractors, public utility companies and other fields of service has been developed by *Ingersoll-Rand Co., 11 Broadway, New York.* It consists of an open-impeller type centrifugal pump driven by a "multi-vane" type air motor and both enclosed in a one-piece housing. The unit weighs 50 pounds, and is designated as sump pump size 25. It will handle clear or dirty water, oil sewage, or moderately heavy sludge. Materials used are suited to the services and include bronze, stainless steel and rust-proof steel for installations that require them.

The pump is intended for lifts of 10 to 40 feet with air pressure of 70 to 90 pounds, but will give satisfactory results under widely varying conditions of head and air pressure. For further information write the manufacturer, mentioning *Excavating Engineer.*

EXCAVATING ENGINEER

A Monthly Publication Devoted to Excavating and Allied Subjects

REGULAR SUBSCRIPTION: $1.00 a year; Canada, $2.00 per year. SPECIAL SUBSCRIPTION: Upon application on card inserted in this number, Excavating Engineer will be sent frequently (not regularly) free of charge. Only for those engaged in the industry of excavation.

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The Business Situation

THE PRESENT business situation reminds one of a late summer afternoon following a thunder shower. How many times has the family sat around postponing a pleasure outing because of a threatening sky or a close oppressive atmosphere that threatened rain. Then in the late afternoon the thunder squall broke and cleared the atmosphere. There was still a chance that it would rain some more, but didn't you notice how quickly the family packed up and started out?

There is no denying that we had our banking problems and we still have some, but the air has been cleared and the psychology of the Nation changed. The situation encountered during the first weeks of March was a very serious one and required drastic action to prevent still more far-reaching trouble but nevertheless, we cannot subscribe to the suggestion that our banking system is fundamentally wrong.

Our financial structure is built with gold as a basis and against this gold is issued paper currency having a total face value of about twice the value of the gold. Upon this structure, during the years past, we have built a structure of credit having ten times the volume of our currency and we have become used to using credit instead of currency. We use credit to such an extent that great sections of our population handle as currency less than ten per cent of their total income. With this system it is obvious that if everyone attempts to change their credit into cash at the same time, there is bound to be serious embarrassment. This weakness has been recognized for many years but it has always been said that such an action on the part of the public was highly improbable and so it was, but it was not impossible. The difficulty through which we have just passed, was brought about by one community after another trying to protect those financial institutions within its borders by declaring bank holidays originally designed only to give the banks involved time to work out their common problem. The trouble with our banking system apparently lies in decentralization—in the fact that we have 48 different sets of state banking laws, and 12 Federal Reserve Districts.

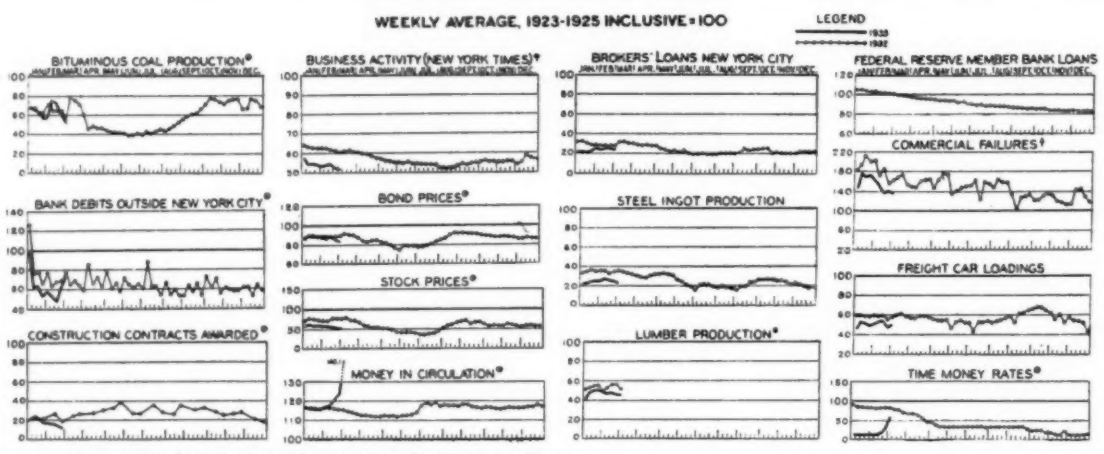
But the most important item of the moment is the change in mental attitude that has come about throughout the country. The picture of our National Government acting with determination, self assurance and dispatch, is probably as much responsible for the change in attitude as the realization being brought home to many that currency and gold may be just as unsatisfactory commodities to hold over a long period of time as have other forms of fixed credit during the past few years.

Currency and gold are returning to the banks at an even faster rate than that at which they were withdrawn during the last week of February and there seems to be little danger of an uncontrolled inflation which would cause still further difficulty and readjustment. Too rapid inflation of prices or a deflation of currency is amply guarded against under the present plan through the fact that the raising of the rediscount rate, will promptly reduce the amount of currency in circulation by making it burdensome for the Federal Reserve member banks to carry large loans with the Federal Reserve banks.

Smith: "My wife sure is thrifty. She made me a necktie out of an old dress of hers."

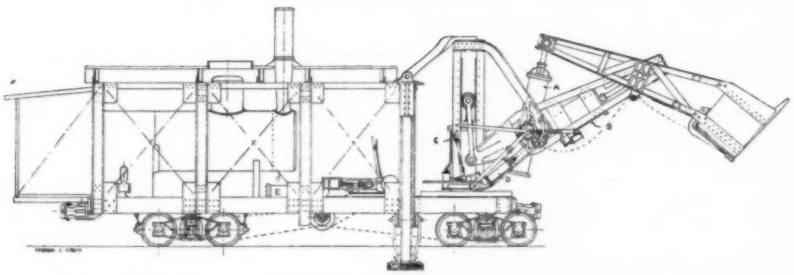
Jones: "That's nothing. My wife made her a dress out of one of my old ties."

WEEKLY BUSINESS INDICATORS


WEEKLY AVERAGE, 1923-1925 INCLUSIVE = 100
LEGEND
BITUMINOUS COAL PRODUCTION*
BUSINESS ACTIVITY (NEW YORK TIMES)†
BROKERS' LOANS NEW YORK CITY
FEDERAL RESERVE MEMBER BANK LOANS
BANK DEBITS OUTSIDE NEW YORK CITY*
BOND PRICES*
STEEL INGOT PRODUCTION
COMMERCIAL FAILURES†
STOCK PRICES*
FREIGHT CAR LOADINGS
CONSTRUCTION CONTRACTS AWARDED*
LUMBER PRODUCTION*
MONEY IN CIRCULATION*
TIME MONEY RATES*
* DAILY AVERAGE † NUMBER ◆ COMPUTED NORMAL = 100 * AVERAGE SAME WEEK THREE LATEST YEARS (1930-1932) = 100

Old Times & Old Timers

Dinkeyskinner Smith Claims a Place 'Longside our Bunkhouse Stove



IN JANUARY we published a request from Old Timer J. F. Sullivan regarding a Kilgore (he spelled it "Kelgore") shovel he discovered in the junk yard at Huastica, Mexico. Vernon L. Smith, a locomotive engineman at the Hanna Ore Mining Company's open pit at Crosby, Minnesota, has a keen interest in shovel work and discovered a drawing and description of the Kilgore shovel in his library. Mr. Smith's copy of the drawing is reproduced on this page and the description follows:

"The car body is built up of I-beams and channels, upon it is mounted a locomotive type boiler 50" diameter and 12' long. Steam is supplied at 150 lbs. pressure. The shovel is propelled by a 6¾" x12" double cylinder engine, four direct acting cylinders are used for digging and swinging and one small direct acting cylinder to trip the dipper latch.

"The cylinder 'E' used for swinging is located on the car floor (below the smokebox of the boiler) and has a rack (notched bar) on the end of the piston rod, which meshes with a heavy gear at the bottom of the mast. To the crosshead of the lifting cylinder 'C' is attached the back end of the boom. This is used in raising the dipper through the bank. The oscillating cylinder 'A', pivoted in the main fulcrum, is connected to the upper end of the dipper arm and is used to give forward and back swing to the dipper. The forcing cylinder 'B' is connected to the fulcrum of the dipper arm through a cast steel crosshead and bearing, located in the dipper arm. This cylinder is used to give a direct horizontal thrust to the dipper along the ground. The small cylinder 'D' for tripping the dipper latch is controlled by a foot lever on the runners platform. The lever connections are such that any or all cylinders can be operated singly or together. The two levers controlling all four cylinders."

Mr. Smith comments regarding the operation of this machine. "Did you note the large cylinder bores on the shovel and also the comparatively high boiler pressure used to feed them. Also only an engineer and fireman was required as no cranesman was needed. The engineer's platform was on what would be the 'circle' where he had a good view of the digging as he was in line with the dipper."

Mr. Smith was unable to give us the name or address of the manufacturer of the Kilgore but is under the impression that this company also built track-laying machines. Can anyone give us further information regarding the builder or the operation of this unusual machine?

Many thanks, young "Old-Timer" Smith. We compliment you on your keen observation and interest. And to you who read this, be you old timer or youngster, have you a story for us of the old days and the old ways?

Come On Old Timers!

Cash for Your Yarns and Pictures!

EACH month we will run in this section anecdotes, adventures and interesting data regarding old times and old timers. The makings must come from you. Send along your pictures and letters . . . facts and pictures that made excavating history. Here are a few questions we've been asked. Help us answer them.

1. Back in 1909 and '10 there was a Gopher Excavator built by the Gopher Manufacturing Company, headquarters Palace Building, Minneapolis, and in 1911 and '12 there were some other Gopher machines built by the Dix Machine Company also of Minneapolis. Who has photographs of these old machines? Send them along—the older and earlier the better. There is many another old timer who would be interested in seeing them.

2. We received a very nice description and a drawing of the Kilgore shovel from Vernon L. Smith of Crosby, Minnesota. Now we are trying to find out if anyone can tell us by whom and where this machine was built. Can you tell us?

3. One of our Old Timers asks about the early tractor-shovels or tractor-cranes. Can you furnish a description or snapshot on any of these old timers? We understand some of these ancestors of modern equipment were weird contraptions but that some of them worked quite successfully nevertheless.

Cutting Through Forest Service Roads

(Continued from page 153)

sidewinding, taking a fresh start and bulldogging the mountain side and its accessories into the semblance of a trail where there was nothing but chaos and disorder before. It was most astonishing to see the manner in which trees were pushed over and dragged out. One could only marvel at the strength of the little giant and the dexterity with which she was handled by the operator. The average consumption of gas for this whirlwind is only twenty gallons per eight hour day. This is the first appearance of a 55 Cletrac on a Forest Protection road in this section and its accomplishments are looked upon with great interest by the men in charge of construction. It just simply unwinds a trail as it goes.

Mountain Roads at $544 per Mile

At the time of my visit, fifteen men were engaged upon this road construction, but, beginning September first it was used as a relief job for thirty or forty men working two shifts of five hours each.

On a thirty day run in August and September, for which time the only accurate figures were computed, 6.27 miles were roughed in, and 4.14 miles completed. On this 10.41 mile stretch, 9323 yards of common were moved at 6.6 cts. per yard, and 698 yards of rock at 74 cents. The cost per mile which included labor, material and equipment rental was $544.

SHOTS from the Firing Line

Federal Aid Fails to Pass 72nd Congress

See Table Showing Current Status of Federal-Aid Road Construction on Page 155

ALTHOUGH considerable pressure was brought to bear, Federal Aid for State Highways for the fiscal years of 1934 and 1935 failed to pass the seventy-second Congress. When the regular Federal Aid bill was blocked in the House, Senator Oddie of Nevada attempted to compel action by attaching it as an amendment to the Federal Gas Tax extension legislation when the bill was received from the House. This strategy was unsuccessful and the extension of the time limit of July 1st, 1933 on the 1 cent Federal Gas Tax also failed to pass.

This means that the Federal Aid bill must be reintroduced and passed in both branches of the new Congress if the Federal Aid highway program is to be carried on for the next two years. Even if this appropriation is given early attention by the new Congress that met in special session last month, it will be difficult to get construction crews to work on the resulting jobs as early as usual this coming season. The extension of the time limit on the one cent Federal gas tax will also be undoubtedly taken up promptly by the new Congress so that this important source of revenue may be extended beyond its present July 1st expiration date.

At this writing it is impossible to predict the attitude of the new administration toward Federal Aid for highway construction but it seems logical that highway building should play an important part in the gigantic public works program that is proposed to bring unemployment relief by adding to the assets of the nation.

There remains available for new projects on March 1st $15,745,969 of Federal Aid appropriations and $8,595,758 of Emergency Relief funds, according to information furnished us by H. S. Fairbank, Chief, Division of Information, Bureau of Public Roads. Reproduced in this issue is a statement by the Bureau of Public Roads showing the current status of Federal Aid road construction as of January 1st, this being the latest compilation available.

The projects under construction and approved for construction as of March 1 involve a total estimated cost of $293-234,558. This cost is to be met as follows: from regular Federal-aid funds $107,153,110, from Emergency Relief funds $111,404,242, from State funds $74,677,206. The time limit on Emergency Relief Funds expenditures has been extended from June 30, 1933, to December 31, 1933.

During the closing session of Congress an appropriation of $35,000,000 of Federal Aid funds previously authorized was made. This in no way affects the amount of new construction which can be undertaken by the States as it is merely one of the appropriations which are made from time to time under the usual procedure of making funds authorized available to the various states as they are needed. First an authorization is passed and then from time to time appropriations are made to carry on the work planned and approved on the basis of the authorization.

Sand, Gravel and Crushed Stone Freight Rate Surcharge Extended to October 1st

THE Interstate Commerce Commission permits the railroads to continue in effect until September 30th, the increase of a six cents per ton surcharge on sand, gravel, crushed stone and slag. The extra charge as authorized was to expire March 31st but will now remain in effect till September 30th. The ruling specifies that it must be removed October 1st.

Patrick McGovern Passes

ON February 22nd, as a result of cerebral hemorrahge, Patrick McGovern died at his home in Great Neck, Long Island. 60 years of age, Mr. McGovern was one of the nations outstanding tunnel contractors. New York's $43,000,000 water tunnel No. 2 now nearing completion was one of his largest and most difficult jobs (July, 1932 Excavating Engineer). He built many sections of the subway systems of New York, Philadelphia and Boston.

Patrick McGovern was born in the village of Black Lion, County Cavan, Ireland on August 15, 1872. Conditions offered him no opportunity for schooling. He went to work as soon as he was old enough to swing a pick and worked as a laborer until he had saved money enough for steerage passage to the United States. One December morning in 1891 the 19 year old lad from County Cavan walked down the gang plank at Boston which was as far as he was able to pay his way. He came alone and knew no one there, but he soon secured a job swinging a pick and before the month was out was being paid 50c extra a day because his hard work earned it.

After a few years as a laborer on contract work young McGovern set out for the Klondike gold fields working his passage as a barge hand. He suffered keenly from the bitter cold and his hands and shoulders were bruised and sore from handling the frozen sacks of sugar with which the barge was loaded. Alaska failed to make his fortune but added much in the way of experience.

On his return Mr. McGovern stopped off in Philadelphia where he worked as a laborer for Contractor Jimmy McNicol. Three years later he was back in Boston working as a patch paver. As soon as he could he bought a horse and cart, his first contracting equipment. After a 12-hour day loading and hauling dirt he would return to his room and map small jobs for which he would seek contracts. Soon these contracts grew larger and more numerous. Mr. McGovern added to his equipment and soon established himself as a competent and successful subcontractor on excavation. His first underground work was on a section of the Boston subway and in 1911-12 he handled his first big job on the Lexington Avenue extention on the I.R.T. East Side subway in New York. Another of his outstanding jobs was the Sixtieth Street twin tunnel now used by the B.M.T. under the East River. This was a war time job and other contractors were failing to complete contracts because of rising wages and labor troubles, but Patrick McGovern went successfully through quicksand and labor difficulties.

Up until the time of his death Mr. McGovern continued his practice of being on the job before the laborers arrived and of staying there until after the whistle blew unless business called him elsewhere. Whenever there was a bit of perilous shooting to be done Mr. McGovern was underground in the danger zone with the workmen until the job was complete. Among hard-rockmen he was considered an expert and his judgment was said to be almost infallible.

Surviving are his wife, formerly Mary McCaffrey, who came from County Cavan to Boston 35 years ago to marry him, and three daughters.

The excavating fraternity will miss Patrick McGovern's vigorous personality and native ability. The secret of his success lay in his ability to lead and his familiarity with every detail of his jobs. We need more men of his caliber today.

Agreement for Parker Dam Made

A CONTRACT between the Metropolitan Water District of Southern California and the Department of Interior, was recently signed covering the construction of Parker Dam. This will be located on the Colorado just below the mouth of the Bill Williams River and will cost $13,000,000. It will raise the water level about 70 feet and produce 80,000 horsepower. All of the money for construction is to be advanced by the Metropolitan Water District and construction will be handled

by the Bureau of Reclamation. The dam will be for the joint benefit of the district and for Indian and public lands in Arizona. In return for its service the Government will retain one-half of the power privileges. The dam will control the flood of the tributaries of the Colorado River between Hoover Dam and Parker Dam and assist in stabilizing the flow of the river. Construction will be effected while Hoover Dam is filling and the contract requires the necessary funds be advanced within ten years. The site chosen is the upper of the two Parker sites which will permit pumping of the water to the Parker area and the Gila lands as separate projects in lieu of a proposed 130-mile canal to the Gila area.

Appropriation Forecasts a Busy Season on the River

TWENTY HOURS before the Seventy-second Congress ended the Senate and House agreed to the conference report on the War Department appropriation and sent it to the White House where it received President Hoover's signature. The bill makes available $19,653,424 for Mississippi Flood control, $348,000 for flood control on the tributaries and $39,388,129 for rivers and harbors. Of this appropriation at least $8,000,000 will be allotted to levee construction with $3,000,000 apportioned to the Memphis District, $2,200,000 to the Vicksburg District and $2,800,000 to the New Orleans District. $8,150,000 will go into revetment and contraction works and $850,000 into dredging. The balance of $2,653,424 is reserved for overhead and contingencies.

General Pillsbury testified before the House Committee that the authorized $19,653,424 appropriation would give the Corps of Engineers a total of $28,000,000 for Mississippi flood control this coming season due to considerable unexpended balances on hand.

It is estimated that there are 105,000,000 cubic yards of earth work remaining to be placed to complete the Mississippi front line levees to the new grade and section. Rumors of President Roosevelt's gigantic public works program to relieve unemployment and stimulate industry indicate that flood control and rivers and harbors will receive additional funds as these plans are developed. It seems probable that the front line levees will be practically completed during the coming season.

Foreign

India

In connection with the construction of the great Lloyd Barrage for irrigation purposes at Sukkur, (See Excavating Engineer for November, 1929) it is proposed that the Public Works Department undertake a comprehensive program of improvements to be carried out as funds permit. The first part will cover three roads totaling 130 miles. A 100-mile road from Karachi to Hyderabad is planned also. An allotment of 250,000 rupees has been made for 1933 by the Bombay Government, and work will be started at once. In connection with this proposed road work it is reported that 60,000 rupees of the above amount have been expended on American road building machinery. Much of the road work around the villages will be done by hand to afford employment and tractors and graders will be used on the open stretches. While the first construction will be on dirt roads, the engineers plan to surface with some form of bituminous mixture when funds are available. It is estimated that dirt road construction can be completed at a cost of about 170 to 180 rupees a mile with tractors and graders, including labor, fuel and depreciation; and the cost of surfacing them with mixed-in-place bitumen or road oil would raise the cost to about 2,500 rupees a mile. The Rupee is quoted around 25½ cents.

Mexico

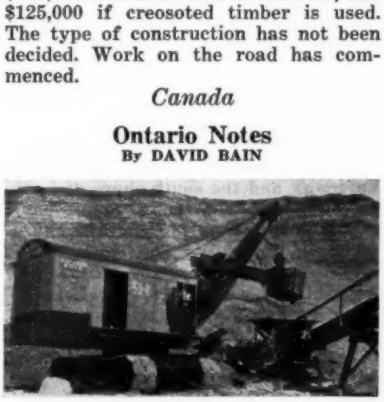
The Governors of the States of Nuevo Leon and Coahuila plan to **surface the 52 mile road between Monterrey and Saltillo.** There are 23 miles in Coahuila and 39 miles in Nuevo Leon and for the purpose of a contract, the two sections are to be considered as a single unit. The Highway Commissions of the two states have agreed immediately to draw up specifications and plans on which contractors will be invited to bid. For further details regarding bids and financing address: The State Highway Commission, Monterrey, Nuevo Leon, Mexico; or The State Highway Commission, Saltillo, Coahuila, Mexico.

A contract for the construction of a 63-mile asphalt surfaced concrete highway between Tijuana and Ensenada, Lower California, has been awarded by the Governor of the District to the **Electrica & Telefonica Fronteriza, S. A.,** Tijuana, Mexico. The contract amounts to $2,100,000 and there is a time limit of 31 months from September, 1932. The work is being financed by the contractors. The Territorial Government pays a certain stipulated sum monthly, the balance to be paid by the Government in 10 years, with interest. The contract price of the road does not include the cost of a bridge over the Tijuana River, estimated at $325,000 if constructed of concrete, and $125,000 if creosoted timber is used. The type of construction has not been decided. Work on the road has commenced.

Canada

Ontario Notes

By DAVID BAIN



The Consolidated Sand and Gravel Company of Paris uses this Bucyrus-Erie 50-B Ward-Leonard electric for loading sand and gravel. A 100-foot inclined belt conveyor carries the material from pit to screen. A 600-foot cross belt along the face was installed after the picture was taken to transfer the material to the incline. The bank is about 40 feet high. A small Thew electric strips the over-burden.

Manitoba

The Department of Public Works is making plans of further dredging in the harbor at Churchill estimated to cost $250,000.

New England Notes

The Department of Public Works of Massachusetts is planning a reinforced concrete sea wall at Oak Bluffs and also reconstruction of sea wall and replacing rip-rap at Long Beach, Rockport.

M. J. McDermott of Georgetown secured grading on 7.83 miles of the Georgetown-Milton Road in Sussex County for $23,928. **W. W. Truitt** of Lincoln City secured 4.7 miles on the Viola-Petersburg Road in Kent County for $18,008.

New York Notes

Utica Construction Company was awarded contract for grading roads at the Wassaic State School on bid of $83,720.

Philadelphia and Vicinity

By M. G. CONWAY

D. KOVATCH

We were indeed sorry to learn of the sudden death of Danny Kovatch of Philadelphia. Mr. Kovatch was operating a Marion gas+electric shovel for Thomas M. Durkin of Buselton on a Pennsylvania State Highway project at Gradyville in Delaware County. At 1:30 P. M. on February 27th the shovel struck a 12-inch Benzol high pressure pipe line which runs between Marcus Hook and Bethlehem and is owned by the Pure Oil Company. Mr. Kovatch was seriously burned, and taken to the Media Hospital. He died at 10:40 P. M. the same day. He is survived by his mother and father; his brothers, Frank, John, Andrew, Louis and Joe, also his sisters, Miss Marion, Mrs. Glenn Upton and Mrs. P. H. Rousseau. Danny Kovatch will well be remembered by Pennsylvania, New Jersey and New York contractors. We wish to extend our deepest sympathy to the Kovatch family.

Delaware Notes

Old Line Construction Company of Chestertown, Maryland bid the low of $40,352 on 7.62 miles of highway construction between Lincoln City and Waples Pond. The work includes 19,000 cubic yards of excavation; 16,000 cubic yards of hand borrow; 2,000 cubic

yards of hand excavation and 4,200 tons of crushed slag.

A. Petrillo Company of Wilmington was low with $81,949 on the grading of a dual road between Glasgow and Bear of 4.71 miles. 75,000 cubic yards of excavation and 2,500 cubic yards of borrow is required.

Low bidder on 3.24 miles of grading and paving between Rice's Corner and Canterbury will probably be to **W. W. Truitt** of Lincoln City on his bid of $53,852. This job involves 12,000 cubic yards of excavation and 3,500 cubic yards of borrow with 3,380 cubic yards of concrete pavement with cork expansion joints.

Low bidders on the March 14th bidding include: **E. Finley Mixner** of Dover for slag surface on 4.75 miles Whitesville to Pepper; **George & Lynch** of Dover, 4.16 miles slag between Staytonville and Framingham; **Wilson Contracting Company** of Wilmington, 5.8 miles of slag, Thompsonville to Sour-Apple Tree.

Virginia Notes

The City of Redford is planning an electric power system including a dam across Little River to cost, including 750 kw. power plant, $129,000. An R.F.C. loan has been approved contingent on approval of the Federal Power Commission.

Perkins-Barnes Construction Company of Blackstone will construct 6.75 miles of road in Fluvanna and Albermarle Counties for $49,780.

S. G. Polino of Fairmont, West Virginia is to build 3.74 miles in Culpepper County for $15,511.

Ohio Notes

By F. B. SMITH

WILLIAM HENRY WARNER

Throughout the excavating industry the many friends of W. H. Warner, head of W. H. Warner and Company, coal mine operators of Cleveland, mourn his passing recently at the age of 84. Born in Youngstown in 1849, he entered the employ of the Brown Iron Company, Mineral Ridge, following the completion of his studies at Western Reserve University. A year later he was teller in a Youngstown savings bank and the second year following became engaged with his father in the iron and coal business—the industry which he followed the remainder of his life. At the time of his death, Mr. Warner was active as senior partner in the firm which bears him name and also President of the Warner Collieries, Warner Youghiogheny Coal Company, The Trumbull Coal Company, Pittsburgh and Ashland Coal and Dock Company and a director of several other industrial and financial incorporations. Two sons, Whitney and Hoyt Landon Warner, both of whom were associated with their father, survive.

The City of Cleveland will soon take bids for dredging the Cuyahoga River. The estimated cost is $80,000.

The U. S. Engineers are making preliminary plans for constructing new turning basin at Sandusky Bay at a cost of $400,000.

Kentucky

G. M. Francisco of Cincinnati bid $39,401 to secure grading of 4.77 miles on the Grayson-Sandyhook Road in Carter County.

By W. E. CHAMBERS

E. O. Korsmo Construction Company of Memphis received a contract in January for grading and draining one and one-half miles of the Jamestown-Albany road in Russell County, at $43,872. The contract includes construction of a bridge over Greasy Creek.

The Campbell Johnson Company of Pikesville was awarded grading and draining on the two miles of the Salyersville-Hindman Road in Magoffin County on their bid of $31,000.

The Frazier-Davis Construction Company of St. Louis getting the contract underway on Green River lock near Glenmore. Their bid on this was $680,-216 and it is expected that the project will require about a year for completion.

Corum Brothers of Madisonville received in February a contract for grading and draining 8 and one-half miles of the Rumsey-Slaughters Road in Hopkins County on their bid of $41,165.

The Codell Construction Company of Winchester was awarded grading and draining on three and one-half miles of the Roxanna-King's Creek Road in Letcher County.

Richard R. Cook of Huntington, West Virginia took the contract for building the sub-structure for earth approaches of a bridge over Tygert Creek on the Fullerton-Olive Hill Road in Greenup County for $9,583.

Michigan Notes

By CLYDE B. DAVIS

A contract for dredging operations in the harbor at Monroe, at a cost of $372,800, has been awarded the **Construction Materials Company** of Chicago, by the War Department. A second Monroe harbor project, to cost $166,320, was awarded the **R. C. Huffman Corporation**, of Cleveland. The upper Lake St. Clair dredging job in the Detroit district was awarded the **Duluth Superior Dredging Company**, at a cost of $209,694.

At a proposed expenditure of $2,650,-000, **improvements in the Keweenaw Waterway and the south shore of Lake Superior**, near Keweenaw Point, have been approved by army engineers in a report to Congress. The work would provide a waterway across Keweenaw Peninsula by way of Portage Lake 25 feet deep and 300 feet wide; a breakwater 5,714 feet long with a mooring basin half a mile long, 25 feet deep and 800 feet wide; a maneuvering basin 1,000 feet wide and 3,000 feet long. Maj. Gen. Lytle Brown, Chief of Army Engineers, estimated the cost of maintaining the project at $60,000 a year. The engineers reported that construction "will promote the safety of navigation and is warranted by the great volume of shipping on Lake Superior and the frequency and severity of storms on that lake."

Articles of incorporation for an organization to prevent deflection of road taxes into channels other than maintenance of the state's roads have been filed with the Attorney General's office. The group is known as **Save Michigan's Roads, Inc.** The officers are pioneers in Michigan good roads movements, who have become alarmed at efforts made to divert gasoline and license tax monies. Traffic Judge John J. Maher, Detroit, is president. A vice-president will be elected for every county in Michigan.

Two damage suits for alleged false test borings at Lansing are to be dismissed and refiled because of failure to file formal claims for damages with the city council. The Folwell Engineering Co., Chicago which built the Logan Street Viaduct is suing for $158,000 and Anderson & Company, Lakewood, O., which built the bridge over the Grand River at Ashland Ave., is suing for $9,596. Both companies have now filed their claims with city council. The cases were docketed in Federal Court, Detroit.

The long drawn-out damage case of the City of Detroit against Julius Porath & Son, contractors, based on collapse of a section of the Southfield sewer early in 1930, has resulted in an award of six cents by a jury in Circuit Court. The jury found that the type of sewer used both in the sand and clay sections was not well-designed but reported that the city could have saved the entire trouble by availing itself of a more thorough inspection service.

Illinois Notes

The U. S. Engineers Office at Chicago will soon take bids for excavating and dredging of the Brandon Road Pool in the Illinois Waterway.

Jeffries and Buckholtz of Peoria secured grading on 1.23 miles of route 29 in Peoria County for $21,839.

Frenzel Brothers of Chicago secured 7.14 miles in Lake County for $99,885.

Bids will be opened by the U. S. Engineers Office at Rock Island on April 21st covering approximately 222,000 yards of excavation for a rock and brush wing and closing dams and bank protections in the Mississippi between the Wisconsin and Illinois Rivers. Specifications may be secured by addressing: Glen E. Edgerton, Lt. Col., District Engineer, U. S. Engineers Office, Rock Island, Illinois.

Bids will be opened April 25th for construction of an earth levee, fill and roadway along the north shore of Arsenal Island on the Illinois side of the Mississippi at Rock Island. Included are 48,000 yards of fill, 5,200 yards of rip-rap, 4,700 yards of black loam and other items. A $5.00 deposit is required for plans which may be secured from the U. S. Engineers Office at Rock Island.

The cut shown in the picture was seven to eight feet in depth and was taken out by the wheeler train, no auxiliary equipment being necessary except a blade machine for smoothing the grade. The rear wheeler of the train, in the picture, has been loaded and the operator is pulling the rope control that will bring the pan to carrying position.

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Shots From the Firing Line— *Continued*

Nebraska Notes

Business interests of Columbus are planning a hydro-electric dam with 20 miles of canal and power plant which will generate 20,000 k.w., about three miles north of Columbus. It is hoped to finance the project partly through a R. F. C. loan. A bill authorizing the project is now before the state legislature.

Kansas Notes

The Kansas Fish & Game Commission, Topeka has made application to the R. F. C. for a loan to be used to construct Ninneseah Lake between Kingman and Pratt estimated to cost $100,000 and for lakes north of Emporia and north of Westmoreland to cost $150,000.

South Dakota Notes

By PAUL G. FRIGGENS

After nestling for fifty years and more in a "mile-high" canyon deep in the heart of the Black Hills and producing during that time more than $270,000,000 in gold **the city of Lead, South Dakota has gone "high hat" and is now moving up the hill.** Great Homestake, largest gold mine in the world, is moving the city up the gulch so that more intensified mining can be carried on beneath the city's streets. Already many of the city's most imposing structures have fallen before the onslaught of the wrecking crews and farther up the gulch new emporiums are taking a new stand. It is the "new deal" of the Homestake. The caving of the underground mine together with the inroads of the "open cut" to the north of the city will in time take the entire portion of lower Lead. Buildings are cracking and settling and timbering has been insufficient to maintain the stress. More than $150,000 a week has been spent in rebuilding and moving the city up the mountain. Excavations for new buildings are being made daily in the upper portion of the city safely beyond the sinking district. The upper picture shows wrecking operations in the business district. The lower the new Homestake south mill, the new shops, cyanide mill, and other Homestake workings.

The above illustration shows a Bucyrus-Erie 32-B owned by the **Homestake Mining Company** excavating at Cyanide No. 2. This particular job consists of digging 17,000 yards of rock and dirt. The machine is operating 18 hours a day and is reported to be giving "wonderful results" by the men on the job.

St. Louis and Vicinity

By A. J. KOENIG

The Missouri State Highway Commission received bids of approximately $1,500,000 on 103 projects. This is the first letting for 1933 and we look for additional lettings in the near future.

Davis Construction Company bid $104,434 on 8 projects in Atchison county and were low with a bid of $363,358 on 18 miles of 20-foot concrete in Clay county. **Martin Wunderlich** was low with a bid of $17,764 on 10 miles of graded earth in Dent county. **S. A. Robertson** was low bidder on thirteen bridges in Pemiscot county. **Otto W. Knutson** with a bid of $16,814 was low for grading 6.33 miles in Putnam county. **Sandy Hites Company** was low bidder for the construction of .673 miles of 20 and 40-foot concrete slab in St. Louis City and St. Louis county on Highway 77 Traffic Relief road. Other low bidders were **Geo. W. Condon Company,** 2.123 miles graded earth in Atchison county, $7,154. **Richmond Construction Company,** 3.4 miles grading, Bollinger county, $4.147. **Dan Sherrer,** 2.929 miles grading and gravel, Caldwell county, $11,952. **H. C. Grunewald,** culvert and bridge, Callaway county. **M. N. Penny,** 9 miles 10-foot concrete, Carroll and Livingston counties, $87,440. **J. R. Brownfield,** 8.52 miles, 3 projects, Cedar county, $4,491; 2.437 miles, Douglas county, $8,612; 9.014 miles gravel Dallas and Laclede counties, $3,960; 3.784 miles graded earth, Greene county, $9,398.

W. A. Ross Construction Company, was low for 2.127 miles of 21 and 40-foot concrete in Clay and Platte counties, $20,314. **Capital Construction Company,** 10.223 miles 10 and 20-foot concrete, Gentry county, $129,240. **McMahan & Waller,** 8.654 miles gravel, Gasconade county, $34,504; 6.231 miles graded earth, St. Clair county, $17,136. **Amos Melberg,** 6.235 miles graded earth, Livingston county, $32,843. **Martin Wunderlich,** 3.669 miles graded earth, Jefferson county, $24,997; 4.873 miles graded earth, Ste. Genevieve county, $6,635; 9.87 miles grading, gravel and bridge, Stoddard and Scott counties, $41,606. 9.197 miles graded earth McDonald county, $24,932, to **J. A. Kerr,** also 10.293 miles, Stone county at $24,380. **M. E. Gillioz,** 13.7 miles gravel, Phelps county, $73,578; 7.63 miles gravel, Ste. Genevieve county, $52,528; 7.48 miles gravel, Wayne county, $152,268. J. A. Kerr, 13.147 miles graded earth, Wright county, $18,581.

John Dillon, St. Louis was low bidder for the construction of a 50-foot concrete bridge over River Des Peres in University City. The work involves 485 cu. ft. concrete, 1070 cu. yds. earth and 135 cu. yds. rock excavation.

The State Waterways Commission of Illinois is planning the construction of bridge and approaches over the Illinois River at Ruby street in Peoria. The estimated cost is $600,000.

The Regional Bridge Company, Kansas City, plan the construction of a toll bridge across the Missouri River between Kansas City, Kans. and Platte county, Missouri.

Jeffries & Buckholtz were awarded by the Illinois Highway Commission for grading 1.23 miles of road in Peoria county.

Union Bridge & Construction Company have contract for constructing bulkhead and breakwater in Illinois River at Peoria, Ill.

River Notes

The bank holiday has somewhat delayed advertisement for bids of river projects. **Awaiting conditions that will permit contractors to furnish bonds and bid freely are two levee sections** to be paid for with left over funds from the Emergency Relief Act appropriation. One of these in the Memphis District will call for some 6,000,000 yards in Upper Yazoo from Hollywood to Tunica. The other in Vicksburg District will call for 1,500,000 yards just above Fitler, Mississippi.

The Mississippi Valley Flood Control Branch of the A.G.C. recently presented to Brig. Gen. H. B. Ferguson, President of the Mississippi River Commission, through a committee consisting of President Frank Sanford, H. B. Blanks, T. J. Clark, and Fred B. Beneke recommendations for changes in specifications on river work. Among the accepted changes are: permission to work Sundays and holidays except on Emergency Relief work; acceptance of work in units of 500 feet or over (rather than in multiples of 500 feet) and without waiting for sodding and timber felling; acceptance of dikes promptly on completion of each separate unit.

Memphis U. S. Engineers Office will take bids on April 18th for 5,843,000 yards of earth work in the Upper Yazoo Levee District. Included are three sections running 766,000, 735,000 and 792,000 yards respectively and extending 3½ miles starting some 3

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Shots From the Firing Line— *Continued*

miles west of Hollywood, Mississippi, and extending to the new loop levee at Mhoon, Mississippi. This work runs from 22 to 26 feet in height. Two sections west of Tunica, Mississippi, run 560,000 and 595,000 yards each on 1.8 miles of 19 to 29 foot levee. Four sections running 2 miles downstream from Moon Lake, Mississippi, require around 400,000 yards each for 26 to 40′ high levees. And there is 485,000 yards south of Friar Point running 23 to 33 feet levee. Also 300,000 of 30 to 32 foot levee west of Stovall, Mississippi. In all of the above work material from existing levees will be used extensively for the new levees. 200 calendar days are allowed for completion of the work. No Sunday or holiday work is permitted except in real emergencies.

Texas Notes

U. S. Engineers, Galveston will take bids at an early date for dredging 390,000 cubic yards from the Sabine Neches Waterway.

S. J. Groves & Sons Company of Minneapolis was the successful contractors on the Red Bluff Storage Dam and Spillway on the Pecos River for the Red Bluff Water Improvement District. The work is estimated to cost $3,500,000 and an R. F. C. loan for financing was pending. The work involves 1,850,000 cubic yards of earth embankment, 118,000 cubic yards of rock riprap, 60,000 cubic yards of crushed stone or gravel blanket and 44,000 cubic yards of concrete, 150,000 cubic yards of earth, 50,000 cubic yards of loose rock and 25,000 cubic yards of solid rock excavation.

New Mexico Notes

The Fort Sumner Irrigation District in DeBaca County is planning a diversion dam and extending of canals involving expenditure of $135,000 on which an R.F.C. loan has been approved.

T. J. Tobin Construction Company of Albuquerque was awarded 7.68 miles of grading in Guadalupe County on their bid of $50,199.

T. J. Tobin Construction Company of Albuquerque was awarded a $50,199 grading contract on U. S. Highway 54-66 in Guadalupe County between Santa Rose and Cuervo. The work begins 12 miles from Santa Rosa and is approximately 7.7 miles in length.

New Mexico Construction Company's bid of $113,468 for drainage, structures and paving on 5.1 miles of U. S. 366 in Bernalillo County between Albuquerque and Barton was thrown out and the work is to be readvertised.

E. Bondurant & Bogle of Roswell bid $55,455 on a 9 mile section of U. S. 85 between Levy and Bond in Mora County. The work consists of grading and drainage structures and includes four treated timber, multiple-span bridges. This contract has not yet been awarded as this is written.

S. H. Veater of Arrey was awarded the contract for plating and crushed base surfacing on 11.2 miles on state highway number 3 in Dona Ana County between Las Cruces and Almogordo. The bid was $33,120.

Arizona Notes

Geo. Herz Company of San Bernardino, California submitted the low bid of $17,430 or $0.083 per cubic yard for the raising of about 11 miles of Colorado River Levee involving 210,000 cubic yards of earth work.

Martin Brothers Trucking Company of Long Beach, California was awarded grading and draining on three miles between Kingman and Ashfork on U. S. 66 for $44,020. They also secured oiling on 15.75 miles on U. S. 89 out of Wickenburg for $56,911.

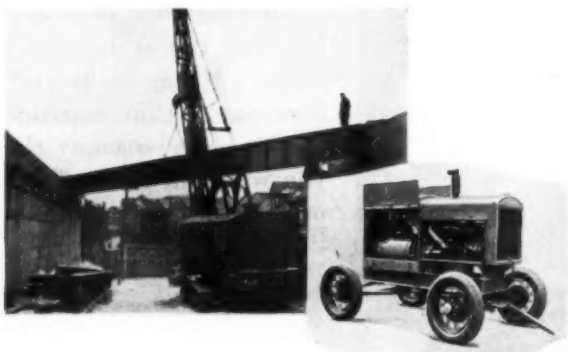
The Bureau of Public Roads at Pheonix is constructing a highway estimated to cost $1,250,000 over Cataline Mountain Range near Tucson with Federal prisoners.

Two fair hitch-hikers were overtaken by darkness and stopped an officer to inquire as to the nearest farm house that would provide a night's lodging.

"Just take the road to your right," directed the stranger, "and you can't go wrong."

"Are there any other roads?' 'asked the co-eds in chorus.

Welded Highway Bridges Another Source of Profit



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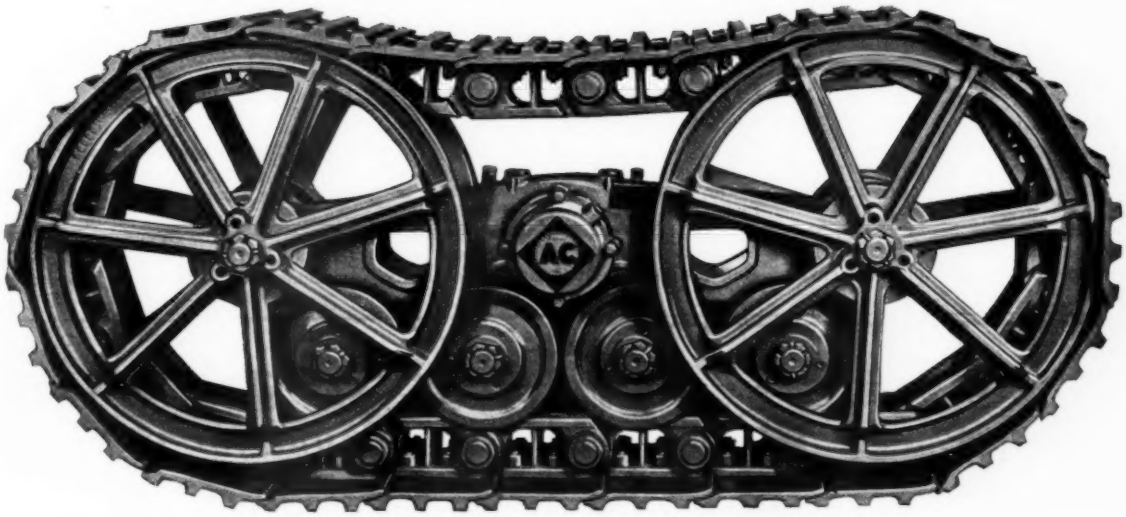

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For your convenience in writing to Allis-Chalmers Mfg. Co., you will find a card bound in this issue.

Shots From the Firing Line— *Continued*

Colorado Notes

By H. M. BIBAUD

A self liquidating loan for the **Sterling irrigation project** totaling $110,000 was granted March 1, by the Reconstruction Finance corporation. The work involves the construction of sixty-one miles of ditch and will water one of the largest farm districts of northern Colorado. A conference will soon map out the work. Bids will then be asked for the project. It is expected that the work will begin June 15 and that approximately 150 men will be given employment for three months. According to R. J. Wright, engineer in charge, the capacity of the system will be enlarged nearly 50 percent. More than 1,200,000 cubic yards of earth will be excavated. The reservoir to hold the flood waters, holds about 42,500 acre feet of water. The district serves 41,700 acres of land.

Charles B. Owens, Denver contractor, was low bidder on the building of 8.7 of Federal Aid highway between Flagler and Arriba at $62,215. J. J. Dooling was second with $66,422. A. R. Mackey and C. A. Sweitzer were third with $67,683. The project requires the road to be made ready for oiling within the next year.

Construction work began March 2nd, on two Federal Aid projects in the Big Thompson canyon. The projects cover approximately five miles of highway from Greeley to Estes Park. **The Lawrence Construction Company** of Denver has moved machinery to the second project west of Loveland. One hundred men are employed daily in two shifts of fifty men each, working five hours a day and six days a week. The old road from Loveland to Estes Park will be widened to eighty feet, to fulfill the requirements of the State Highway Department.

The famous **Wolf Creek Pass** between Del Norte and Pagosa Springs on Highway No. 160 which is the shortest route between Chicago and Los Angeles comes under early highway construction plans. Work on the Pass has never been completed, but many miles of the highway are notable for fine construction work, finished over a difficult section where early and deep snows render labor impossible for many months of the year. Work will be resumed in 1933 on specified sections. The pass is remarkable for scenic grandeur.

Colorado Springs was awarded the right, March 1st, to divert water from Fountain Valley, in Pueblo County, to Catamount creek, where the city proposes to construct a reservoir to augment the domestic supply. A special meeting of the city council was called March 2nd in Colorado Springs following the court victory. Immediate steps are to be taken under consideration for construction of a proposed reservoir on the north slope of Pikes Peak.

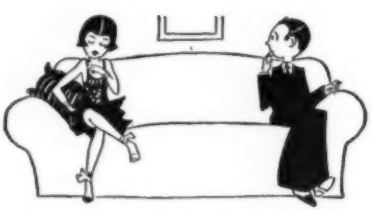
Montana Notes

J. A. Terteling & Sons of Spokane contracted for grading of 4.26 miles on the Libby-State Line National Forest Road in Lincoln County for $121,157.

Oregon Notes

S. H. Newell & Company of Portland were awarded 1½ miles of roadbed widening on the Pacific Highway in Douglas County on their bid of $30,250. Bids ranged from this figure to $66,103.

Lindstrom & Feigenson of Portland took the grading and paving of approaches to the Santiam River Bridge



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One of a Family
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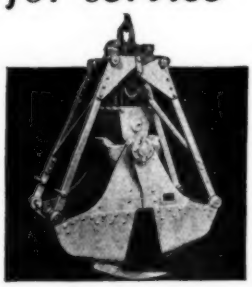

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Class "K" is just the bucket for digging through surface soil and clay, for excavating loam, sand and shale, for sewer work.

Bulletin No. 654 gives interesting operating and construction details; also sizes weights and dimensions of the Hayward Class "K" Clam Shell. On request.

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His shadow falls
the hour the contract is signed

Before the ink is even dry on the contract, Time starts crowding relentlessly. But the excavating contractor who uses a Bucyrus-Monighan Walker keeps a step ahead of Time!

The Walker saves precious hours. It moves in straight lines. It can zig-zag or advance laterally to the line of work. It works on wet footing that stops other types of excavators. Less time is consumed in moving; and that means more digging, quicker completion, greater profits. Bucyrus-Monighan Company, Chicago, Illinois.

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For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

Shots From the Firing Line— *Continued*

on the Pacific Highway at Jefferson for $14,355.

Schmeer & Williams of Portland will furnish the crushed rock for the Ironside-Brogan section of the John Day Highway. Their price delivered in stockpiles is $9,850.

Edwin C. Gerber of Oregon City delivers the rock for the Hot Lake—North Powder section of the Old Oregon Trail for $7,530.

Nevada Notes

Nevada Rock and Sand Company, Incorporated of Reno, with a bid of $57,756 was awarded the contract for constructing that portion of the State Highway System in Lyon County between Dayton and 9 miles Northeast.

Dodge Construction, Incorporated, of Fallon was awarded the contract for constructing that portion of the State Highway System in Lyon County, between 12 miles and 2 miles West of Lahontan. Their price was $68,577.

Isbell Construction Company of Carson City with a bid of $35,462 was awarded the contract for reconstructing that portion of the State Highway System in Douglas County, between 5 miles east of Holbrook and the East County Line.

M. Apgar, a shovel foremen employed by Six Companies, Inc., at Boulder Dam was given a bronze medal by the Joseph A. Holmes Safety Association at its annual meeting held in Washington, D. C. The Association awarded ten medals and two certificates of honor to individuals in the mineral and allied industries for courage and resourcefulness in time of emergency. Mr. Apgar saved the life of George Carr, an electrician who came in contact with 2300 volts at the jack switch of an electric shovel in one of the diversion tunnels of the Hoover Dam project on February 10, 1932. The shovel foreman threw a rope around the body of the electrician pulling him loose, thereby saving his life. Mr. Apgar was standing on wet ground and himself received a considerable shock.

San Francisco and Vicinity

By H. L. LIVINGSTON

The following construction companies were low bidders on the **San Francisco-Oakland Bay Bridge** for contracts which have been opened to date:

East Bay Substructure involving four piers under Contract 4 and seventeen piers under Contract 4-A between Yerba Buena Island and Oakland. Low bidder—**Bridge Builders, Inc.,** San Francisco, in the amount of $4,495,854.00. This company is made up of the following—

W. A. Bechtel Company, Henry J. Kaiser, Warren Bros., Raymond Concrete Pile Corporation, Dravo Contracting Company, Missouri Valley Bridge & Iron Works and Utah Construction Company.

Contract 6 and 6-A combined, which includes the West Bay Superstructure, Cables and Attachments—

Low Bidder—**Columbia Steel Company** in the amount of $13,732,471.00.

Contract 7—Superstructure East Bay Crossing. Low bidder—**Columbia Steel Company** whose contract was $8,798,096.00.

The Hanrihan Company of San Francisco have been awarded contract by the California Division of Highways at Sacramento for 3.2 miles of grading and surfacing between Manila Ranch and Bartlett Springs in Lake County. The amount of this contract is $59,959.

Plans and specifications have been completed by E. C. Eaton, Chief Engineer of the Los Angeles Flood Control District, for the **Eaton Canyon Dam** at Washington Street, east of Pasadena. After being approved by the State Engineer, bids for the construction of this dam will be called for by the County Board of Supervisors. The dam is to be 40 feet high, 1,000 feet long, of gravel fill type with concrete face and a roadway across the top. The estimated cost is $500,000.

J. F. Shepherd of Stockton, was low bidder to the California Division of Highway for 3.9 miles of grading and surfacing between Dorris and the Oregon State line in Siskiyou County. The amount of this bid is $85,909.00. The principal item of this contract is 163,200 cu. yds. of unclassified excavation.

Gogo & Rados of Los Angeles have been awarded contract in the amount of $118,547 by the California Division of Highways for 2.9 miles of grading and asphalt concrete paving between Union Avenue and Minkler Spur in Kern County.

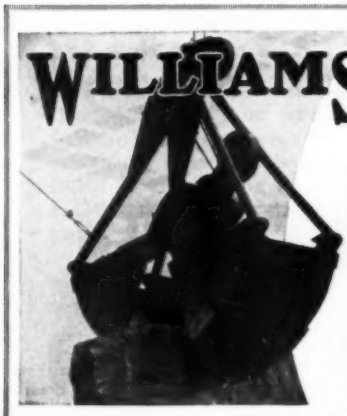
By EMIL REINHARDT

Working right through winter weather, with practically no loss of time despite the severest snowstorm of years, **Hemstreet & Bell** have just completed excavation for their grading contract on the new road into Wawona and Yosemite National Park by way of Maders, Coarse Gold and Oakhurst. The contract involves grading for four miles of road, all in the Sierra National Forest and all through a very rough country. The formation chiefly encountered was granite, more or less decomposed but frequently hard enough to require breaking with explosives before it could be moved. The job amounted to 125,000 cubic yards. Where the material was anything but the hardest, a LeTourneau Rooter, hauled by a Caterpillar Sixty was used to break it up. Two LeTourneau 9-yard Carry-All Scrapers, powered by Caterpillar Sixtyfives, used on the excavation, are now being used to complete the grade. These scrapers carried material over an average haul of 600 feet with an average rate throughout of better than 90 cubic yards an hour. They reached a maximum rate of 120 cubic yards an hour each.

The work was done under Federal Relief allotment, employment being limited to 30 hours per week for each man. Work consequently was carried on in two five-hour shifts, six days a week. The project was started November 7 and excavation was finished February 3. The lost time for the entire job was 7 hours, due to an unusually severe snowstorm.

Judge: "Why didn't you stop when the officer waved at you?"

Co-Ed: "Why, Judge, I'm not that kind of a girl."



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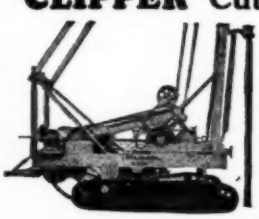

The many inbuilt advantages of the new Loomis "Clipper" size 44—point to bigger profits from drilling jobs. Friction clutch operated full-swing crawlers, extreme ruggedness, simplicity and accessibility combine to save time and cut upkeep and operating cost. It easily climbs unusually steep grades and can be shifted into position in a jiffy. Equipped with steel frame, wooden or steel mast—wire or manila line.

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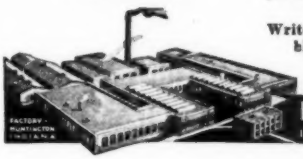
Special Shapes

70% More Hours

" * * * your lining is giving approximately 70% more actual operating hours than the lining with which these machines were previously equipped * * * it does not cut or score brake drums," writes Micheal Pontarelli, well known Chicago contractor.

Mr. Pontarelli's experience tallies with that of other contractors who find that Ebonite Friction Blocks, Roll Lining and Facings last longer and hold their braking quality all the way through—reduce adjustments and increase production.

Write for new folder showing friction blocks, lining, facings and prices.



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Power cables ordered from Bucyrus-Erie are proving their dependability in the field.

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A Machine for Shifting and Raising Your Track

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THE NORDBERG PATENTED TRACK SHIFTER

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Los Angeles and Vicinity

By J. I. MORAVEC

Here goes the first shot on **West Slope Construction Company's** $8,600,-527 job on **San Gabriel Dam No. 1.** Posed before the recording microphone below are (left to right): F. C. Ruhloff, Bucyrus-Erie Company; Fort Flowers, President, Differential Steel Car Company, Findley, Ohio; Newton W. Withers, General Manager, Western Construction News and Highway Builder; Mark J. Woodhull and J. H. Sackett, Bucyrus-Erie Company.

San Gabriel Dam No. 1 is the largest of two dams being constructed for the

Los Angeles Flood Control District to impound 70,000 acre feet of water as a flood control measure and to conserve the water supply for cities in the Los Angeles District. It will be of the rock fill type, reaching up 275 feet above stream bed and carrying a very flat slope on the downstream face. Excavation and placing of about 5,000,000 cubic yards of rock is required. This excavation will be handled by Bucyrus-Erie machines—120-B electrics, 52-B Diesels and 37-B gasoline.

Wenzel & Henock of Milwaukee have satisfactorily qualified their bid of $7,-339,100 on the San Jacinto tunnel contract with the necessary surety bonds according to a recent announcement from General Manager F. E. Wemouth of the Metropolitan Water District. Work will probably be underway before this issue of Excavating Engineer reaches you. It is estimated that from 600 to 700 men will be employed for a period of six years.

Bids are now being taken by the Metropolitan Water District of southern California for the **Valverde and Bermasconi Tunnels** on the Metropolitan Aqueduct. The Valverde is 37,900 feet long, the Bermasconi is 5,920 feet. Bids for the Iron Mountain, Coxcomb and Cottonwood tunnels close April 17th. The Iron Mountain runs 39,805 feet, the Coxcomb 17,530 feet, and the Cottonwood 20,088 feet. Bids are being taken on both 16 foot and 12 foot 4 inch inverted horse shoe sections.

Hawaiian Notes

By PERRY H. KRAFT

The Navy Department has awarded the contract for dredging the middle lock shoal of Pearl Harbor to the **Hawaiian Dredging Company.** Low bid submitted was 35 cents a yard.

At a meeting of the Engineering Association of Hawaii, in Honolulu, **Leslie J. Watson** summarized his observations on the organization of harbor boards, their financing and administration as seen by him on a recent trip to several West Coast ports.

A contract for pulling and driving piles at Pearl Harbor naval base, has been awarded to **Hawaiian Dredging Company.**

Papaa Gulch, one of the widest and deepest in the islands, is to be bridged on the road between Honolulu and Schofield and northern Oahu. The cost is estimated at about $800,000. The **Hawaiian Dredging Company** and the **Hawaiian Contracting Company** are expected to do the bulk of the work. With the building of new bridges and straightening of road, distance from Honolulu to Schofield Barracks will be shortened 2.3 miles.

"I'm sorry," said the diner, who hoped to get away with it, "but I haven't any money to pay for that meal."

"That's all right," said the cashier. "We'll write your name on the wall and you can pay the next time you come in."

"On the wall!" exclaimed the diner. "But everybody will see it."

"Oh no they won't. Your overcoat will be hanging over it."

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16 years' experience includes operating of Bucyrus-Erie, Northwest, Koehring and Orton machines on highway grading and drainage work. Can handle Gas+Air, gasoline and steam powered machines. Prefer dragline work anywhere in U. S. A. Excellent repair man. Married. Can furnish reliable references. Present location, Ohio. Box 5401.

SHOVEL CRANE AND DRAGLINE OPERATOR

15 years' experience on gasoline, G+A, Steam and Electric machines. Bucyrus-Erie, Thew and Northwest machines. Prefer operating Bucyrus-Erie. Have worked on highway and railroad grading, quarry excavation. Willing to go anywhere in the U. S. A. Can do all repairing and furnish excellent references. Box 5402.

SHOVEL OPERATOR

33 years' experience on full revolving shovel and railroad type shovels on all kinds of highway, grading, coal stripping and construction work. Familiar with both small and large machines. Can do my own repairing and furnish class A references. Willing to go anywhere. Present location, Pennsylvania. Box 5201.

DRAGLINE-CRANE-SHOVEL OPERATOR

Have had 15 years' experience on Diesel, electric and steam machines on levee and stripping operations. Will go anywhere. Married. A-1 references furnished. Can handle own repair work. Present location, Illinois. Box 3803.

ENGINEER-FOREMAN-SUPERINTENDENT

Seven years' experience for Guggenheim Bros. in Bolivia and Chile as mining engineer and mining foreman. Later joined Snare Corporation as quarry engineer and in charge of all blasting, railroad work, maintenance and crushing plant, later in full charge of quarry. Assigned to plan excavation for spillway and construction on the dam of the Malpaso Power project for the Cerro de Pasco Copper Corporation in the Peruvian Andes. At present employed as quarry superintendent in Europe but would like to secure more responsible position preferably in South America. 36 years old, married, no children. Graduate Norwegian Technical College with one year post-graduate work at Columbia. Talks fluent Spanish, German, English, Scandinavian and fair French. Capable of planning and directing almost any type of excavating project. Write Box 5301.

DRAGLINE-SHOVEL OPERATOR

Have 18 years' experience on drainage and highway work. Will go anywhere in U.S.A. Married. Can do own repair work and furnish reliable references. Present location, Florida. Box 5302.

CONSTRUCTION SUPERINTENDENT

I have 20 years' experience as shovel operator, master mechanic, erector of construction machinery and highway foreman. Willing to accept position with any construction company. Can furnish the best of references. Address Box 5103.

ENGINEER-SUPERINTENDENT WANTS CONNECTION WITH CONTRACTOR

Twenty years' exceptional experience in factory construction, rock work, roads, dams, tunnels, hydro-electric developments, foundations. Has produced results under difficult conditions and can handle large program in whole or part. Eight years Latin America. Go anywhere. Box 5102.

DRAGLINE-CLAMSHELL-SHOVEL OPERATOR

Have 20 years' railroad, quarry, drainage, levee and highway experience operating Bucyrus-Erie and Northwest shovels and draglines, gasoline, steam, Diesel and electric machines. Willing to go anywhere on any machine. Can furnish good references and do own repair work. Married. Present location, Indiana. Box 4101.

MINING ENGINEER

Mining Engineer, 34, married, fluent Spanish, desires position with responsible company. Experience — two years assistant engineer gold mine; three years foreman in large underground copper mine; six years foreman to mine superintendent open pit operating 25 electric shovels and draglines. Available immediately. Location, Maryland. Box 3801.

CONSTRUCTION AND MAINTENANCE ENGINEER

Over 25 years' experience on all types of shovel, cranes, locomotives on general construction work. Capable of taking full charge of crew. At present located in Australia. Available for work in New Zealand, China or Federated Malay States. Can furnish excellent recommendations. Address replies to W. J. A., 22 Ruthven Street, Waverly, N.S. Wales, Australia.

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30-B Bucyrus steam shovel. Located Charleston, Mississippi. Price $1500. Box 303-SS.

BUCYRUS-ERIE EXTRA HIGH LIFT TYPE B-2 steam shovel, 21-foot 3-inch boom, 16-foot dipper handle, one-yard inserted tooth dipper, single shaft "cat". Excellent condition. Will sell or rent. Box 384-SS.

OSGOOD GASOLINE ONE-CUBIC-YARD COMBINATION SHOVEL-CLAMSHELL-DRAGLINE. Six cylinder Beaver motor. Overhauled late 1931. Bargain price. Box 323-SS.

BUCYRUS-ERIE 20-B steam shovel ¾-yard Dipper. $1,000. Chicago territory. Box 348-SS.

THREE TYPE A BUCYRUS-ERIE STEAM SHOVELS. Good value. $500 each.

FOUR TYPE B BUCYRUS-ERIE STEAM SHOVELS. Good operating condition. $1000 each. Box 328-SS.

ONE 18-B BUCYRUS-ERIE, ⅞-yard dipper on full revolving caterpillars. Box 182-SS.

BRAND NEW PAGE DRAG SHOVEL EQUIPMENT suitable for application to Bucyrus-Erie 1030, 1035, or 32-B machines now in the field, consisting of 17-foot 1½-inch boom, 11-foot dipper handle, and two ¾-cubic-yard dippers: one 38-inches wide over cutters—the other 49½-inches wide over cutters, together with auxiliary A frame and ropes. Priced below cost. Box 381-SS.

MARION MODEL 21 COMBINATION HIGH LIFT STEAM SHOVEL, ¾-cubic-yard manganese steel dipper, 15-foot dipper handle, 20-foot shovel boom. Also includes 40-foot boom crane equipment including two drums. Boiler retubed and machine is in excellent operating condition. Location about 15 miles from Baltimore, Maryland. Price for immediate acceptance, subject to prior sale, f.o.b. present location—$1,800. Box 396-SS.

BUCYRUS-ERIE REBUILT DIESEL combination 1½-cubic-yard rope crowd shovel and 50-foot boom dragline. Atlas Diesel engine. Used very little. New machine guarantee. Box 392-SS.

THEW "O" ¾-cubic-yard gas shovel rebuilt 1931 and mounted on new center drive "cat". Box 343-SS.

BUCYRUS-ERIE D-2 DIESEL RECONDITIONED AND GUARANTEED 1-cubic-yard shovel and 40-foot boom dragline equipment. Box 284-SS.

P&H MODEL 204. Shop number above 2200 combination Shovel Clamshell. 19' shovel boom, 14' 6" dipper handles, ½ cubic yard dipper, 35' clamshell boom, ½ cubic yard Owens Type M digger type bucket. Both front end equipments less than one year old. Excellent condition. Box 284-SS.

BARGAIN

Bucyrus-Erie Type B number 1982, ¾-yard steam shovel on caterpillar mounting with dragline attachment. Ideal for Construction work or Placer mining. Good condition, located Colorado Springs, Colo. Price right. Box 362-SS.

BYERS BEARCAT, Model 27, gasoline ½-cubic-yard Skimmer scoop, crane-clamshell and drag shovel with front opening dipper. Engine—4-cylinder, 4"x5" Hercules Model OX. Machine new July 1928. Excellent condition. Box 293-SS.

TYPE B BUCYRUS-ERIE COMBINATION HIGH LIFT STEAM SHOVEL, 19-foot 8-inch boom, 16-foot dipper handle, ⅝-cubic yard dipper, power boom hoist and 36-foot boom clamshell equipment complete. Located central Indiana. Price as is, f.o.b. present location $2,000. Box 311-SS.

ONE P&H MODEL, 208 45' boom dragline (no bucket). "Cats" 15½' long, 9' wide, 22" treads, 100 H.P. Waukesha High Altitude Engine. Box 249-SS.

BUCYRUS-ERIE GA-3 GAS-AIR HIGH LIFT SHOVEL, 22-foot 6-inch boom, 16-foot dipper handle, 1½-cubic-yard dipper, electric starter, steel cab, single shaft "cat". Wisconsin 6-cyl. 5¼"x6½" Gas Engine, shipped from factory July, 1932. This machine very latest design. Factory guarantee. Will sell or rent. Box 388-SS.

BUCYRUS-ERIE REBUILT HIGH LIFT STEAM SHOVEL, 19-foot 9-inch boom, 16-foot dipper handle, ⅞-yard dipper, power boom hoist, "cat"-mounted. Excellent condition. Will sell or rent. Box 386-SS.

BUCYRUS-ERIE SLIGHTLY USED ⅜-CUBIC YARD Rope crowd gasoline shovel. Will demonstrate. Box 282-SS.

MARION MODEL 32, shop No. 5459, mounted on "cats," steam-powered, 1¼-cubic-yard dipper, 24-foot boom, 17-foot 6-inch dipper handles. Box 82-SS.

ONE TYPE "B" BUCYRUS-ERIE STEAM MACHINE, mounted on "cats", ¾-cubic-yard dipper, shop number 2301, 19-foot boom and 16-foot dipper handle. Box 83-SS.

USED P&H MODEL 700 gasoline, combination shovel-dragline, shop number 3007, including 1¼-cubic-yard drag scraper bucket. Dragline boom 40-foot plus 10-foot extension, shovel boom 25-foot 10-inches, dipper handle 19-foot 3-inches, dipper 1¼-cubic-yard. Engine Waukesha Type WL 4 cylinder 6¼"x7". Good condition. Some repair parts on hand. Machine located Tilleda, Wisconsin. Box 378-SS.

NORTHWEST SHOVEL, model 105, caterpillar mounted, 24-foot boom, 1-cubic-yard dipper, 16-foot dipper handle. In good condition. Price $4,500, f. o. b. Utica, New York. Box 84-SS.

BUCYRUS-ERIE 21-B GAS FRICTION SHOVEL, 18-foot 6-inch boom, 14-foot dipper handle, ¾-yard dipper, chain crowd, single shaft "cat". Wisconsin B-3 4-cyl. 5½x6½-inch engine. Shipped from factory August, 1931. Excellent condition. Sale price approximately one-half new selling price. Will rent. Box 387-SS.

BUCYRUS-ERIE TYPE B-2 high lift steam shovel "Cat" mounted. Good operating condition. Will rent. Priced to sell. Box 286-SS.

MARION STEAM SHOVEL, MODEL No. 21, high lift boom, and forward drum, boiler just retubed, location near Baltimore, in excellent condition. Price $1,800. Address Box 267-SS

AMERICAN 1-CUBIC-YARD GASOLINE SHOVEL. Motor overhauled 1932. Excellent condition. Will rent. Box 357-SS.

REBUILT GA-2 BUCYRUS-ERIE SHOVEL mounted on single shaft caterpillar, 1¼-cubic yard inserted tooth dipper, 22-foot 6-inch boom, 16-foot dipper handle, starter. Carries guarantee of new machine. Box 43-SS.

MARION MODEL 21 AC-DC electric shovel, 20-foot boom, 15-foot dipper handle, ¾-cubic-yard dipper. Suitable to operate on power-supply 3-phase 60-cycle 220 or 440 volt. First class condition. Box 208-SS.

ORTON SHOVEL, new 1928. 16-foot 4-inch boom, 12-foot dipper handle. ¾-cubic-yard dipper. Box 100-SS.

INSLEY ½-CUBIC-YARD SHOVEL, full-revolving. Shop number about R-200 (2 years old). Machine in excellent condition. Has had best of care. Located in Wisconsin. Box 238-SS.

20-B BUCYRUS-ERIE STEAM SHOVEL, serial number 4000; caterpillar mounted; 18-foot boom, 12-foot 6-inch dipper handle, 1-yard dipper; shipped new in 1923; located western Missouri. Bargain. Box 241-SS.

BUCYRUS-ERIE SLIGHTLY USED 1035 gas friction shovel, factory inspected, new machine guarantee. Rope Crowd, 23-foot boom, 15-foot dipper handle, ⅞-yard dipper, including Kohler light plant installed. Exceptional bargain. Box 382-SS.

P&H MODEL 600. New 1929. 20-foot shovel boom, 14-foot 3-inch Dipper handle, 1-yard Dipper. Also 40-foot boom Clamshell Dragline Equipment. Waukesha 75 H.P. Engine. Box 218-SS.

BUCYRUS-ERIE EXTRA HIGH LIFT B-2 STEAM SHOVEL, 21-foot 3-inch boom, 18-foot 4-inch dipper handle, ⅞-yard dipper, power boom hoist, single shaft "cat". Located Massachusetts. Good condition. Priced very low. Box 385-SS.

UNIT MODEL B three-quarter swing, ⅝-cubic-yard Shovel. New 1928. Excellent Condition. Box 350-SS.

BUCYRUS-ERIE TYPE "GA-2" GAS+AIR SHOVEL, shop number 4117, mounted on spur gear drive caterpillar trucks, and equipped with a 24-foot boom; 18-foot, 4-inch dipper handle; 1-cubic-yard manganese cast front socket inserted tooth dipper; power boom hoist; air self-starter, and all equipment and appurtenances in accordance with the specifications of Bucyrus-Erie Company, f.o.b. cars shipping point Virginia. Box 126-SS.

USED BUCYRUS-ERIE 30-B DIESEL SHOVEL —25'9" Boom, 14' Dipper Handle, Box 251-SS.

Bay City Tractor-chain crowd ⅝-yd. shovel. "Cat" mounted. Includes clamshell attachment and bucket. McCormick-Deering power unit. New as clamshell 1928. Shovel equipment new 1932. Very good condition. Low price. Box 391-SS.

P. & H. MODEL 206 Gasoline Combination Shovel and Clamshell machine. Good condition. Located vicinity Chicago. Box 336-SS.

BUCYRUS-ERIE TYPE-B REBUILT high lift steam shovel. Will rent. Guaranteed. Box 285-SS.

BUCYRUS ERIE So. Milwaukee, Wis.

OFFERS FOR SALE OR RENT

FACTORY REBUILT and USED SHOVELS--CRANES--DRAGLINES

Please send me full details on:

- ☐ B-E ⅞-yd. Gas Shovel. Slightly used.
- ☐ P. & H. 600 1-yd. Shovel-Dragline.
- ☐ B-E 32-B Gas Drgln. 45-ft. boom. Like new.
- ☐ Osgood "Conqueror" 1-cubic-yard gasoline shovel. 6 cylinder Le Roi Engine. Starter battery lighting system. Good condition.
- ☐ Monighan Dragline 60-ft. boom. Priced right.

Name .....

Address .....

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards
Continued

FOR SALE—AMERICAN STEAM DITCHER, equipped with ¾-cubic-yard bucket, mounted on flange wheels for off the car service and including caterpillar mounting. Machine in excellent mechanical condition. Located in Southeastern Arkansas. Box 159-SS.

RECONDITIONED TYPE-A BUCYRUS-ERIE STEAM SHOVEL on caterpillars, ⅝-cubic-yard dipper, 16-foot boom, 13-foot dipper handle, boom hoist, Massachusetts boiler. Machine thoroughly inspected, worn parts replaced. Guaranteed to be in first class operating condition. Will rent or sell. Box 37-SS.

20-B BUCYRUS-ERIE DIESEL SHOVEL with 36-foot dragline boom. Machine No. 4133.

20-B BUCYRUS-ERIE STEAM SHOVEL with 36-foot dragline boom. Machine No. 4145.

BUCYRUS-ERIE GAS + AIR CRANE with 40-foot boom, ¾-yard Page Dragline bucket. Fairleads and shovel boom, no dipper stick. Machine No. 4347.

TYPE B BUCYRUS-ERIE High Lift Steam shovel. Machine No. 3110.

Box 373-SS.

MARION TYPE 32 FULL REVOLVING STEAM SHOVEL, shop number 4639, mounted on four belt caterpillar type mounting and equipped with standard boom and dipper handle and 1¼-cubic-yard dipper. Shipping point western Virginia.

This machine should be an excellent purchase at the price offered, for quarry or slag bank operation. Box 212-SS.

LINK-BELT GAS SHOVEL, one-yard dipper, 22-foot boom, 16-foot dipper handle, Waukesha JL 6"x7" motor. Good operating condition. Box 377-SS.

BUCYRUS-ERIE 1030, ¾-cubic-yard rope crowd gasoline shovel. Factory rebuilt and guaranteed. Box 283-SS.

TYPE B-2 BUCYRUS-ERIE STEAM SHOVEL, number 9830, mounted on single shaft caterpillar type mounting. Equipped with 21-foot 3-inch boom, 16-foot dipper handle, ⅞-cubic-yard inserted tooth dipper. Boom hoist and Mass. standard boiler. Located vicinity of Boston. Reasonably priced. Box 345-SS.

BUCYRUS-ERIE brand new 1035 gasoline shovel, rope chain crowd. Also clamshell or dragline equipment. At price you cannot refuse to consider. Box 356-SS.

BUCYRUS-ERIE GAS+AIR Combination high lift shovel and dragline equipment. Chain drive. "Cats." Very good condition. Located vicinity Chicago. Box 337-SS.

P&H MODEL 600—1-yard Gasoline Shovel. Three years old. Excellent condition throughout. Just been thoroughly overhauled. Will sacrifice at bargain to responsible buyer. Located in Wisconsin. Box 363-SS.

BUCYRUS-ERIE B-2 HIGH LIFT STEAM SHOVEL, 19-foot 9-inch boom, 16-foot dipper handle, one-yard inserted tooth dipper. Good operating condition. Price this machine could be earned and paid as rent within a few months. Box 383-SS.

Small Draglines
Under 2 Yards

P & H Model 206 B Dragline. Good operating condition. Very favorably priced. Box 390-SD.

BUCYRUS-ERIE D-2 DIESEL one-cubic-yard shovel. Also 40-foot boom dragline equipment. Reconditioned and carries new machine guarantee. Box 284-SD.

BUCYRUS-ERIE ATLAS DIESEL DRAGLINE. Practically new. 40-45 or 50-foot boom. Extra long "Cat" with wide treads. Kohler light plant. 1¾-cubic-yard Omaha bucket. New machine guarantee. Box 393-SD.

BUCYRUS-ERIE GAS+AIR combination high lift dragline and shovel. Chain drive. "Cats." Excellent condition. Located vicinity Chicago. Box 337-SD.

BUCYRUS-ERIE E-2 DIESEL DRAGLINE, caterpillar mounted, 50-foot boom, 1¼-cubic-yard Omaha bucket, Kohler lighting plant. Machine was new in July 1930 and has been used less than 6 months. Box 243-SD.

MONIGHAN DRAGLINE, 60-foot boom, mounted on 1-W walker and 1¼-cubic-yard Page bucket. Good condition. Price right. Box 339-SD.

BUCYRUS-ERIE TYPE D-2 DIESEL DRAGLINE, shop number 5055, 45-foot boom and 1 cubic-yard Page Class "M" drag bucket. Located Eastern Missouri. Priced to sell. Box 166-SD.

If You Do Not Find What You Want Listed—Write Us
Excavating Engineer
South Milwaukee, Wis.

P&H MODEL 700 USED GASOLINE COMBINATION DRAGLINE-SHOVEL, shop number 3007, 40-foot dragline boom plus 10-foot extension and 1½-cubic-yard drag scraper bucket. 25-foot 10-inch shovel boom, 19-foot 3-inch handle and 1½-cubic-yard dipper. Waukesha Type WL 4 cylinder 6¼"x8" engine. Good condition. Some repair parts on hand. Machine located Tilleda, Wisconsin. Box 378-SD.

30-B BUCYRUS-ERIE DIESEL DRAGLINE with 40-foot boom and 1-cubic-yard bucket located in Alabama. Box 91-SD.

KOEHRING MODEL 1 GAS DRAGLINE 40-foot boom and Page M ¾-cubic-yard bucket. Good operating condition. Box 374-SD.

OSGOOD ONE-YARD gasoline combination Dragline-Shovel-Clamshell. Overhauled late in 1931. Six cylinder Beaver motor. Bargain price. Box 323-SD.

P & H MODEL 700 DRAGLINE; number 2394 equipped with a 50-foot boom, light 1½-cubic-yard drag bucket, electric light plant, and powered with 4-cylinder Atlas Diesel engine. Box 189-SD.

P & H DRAGLINE MODEL 700; number 2456 equipped with a 50-foot boom, light 1½-cubic-yard drag bucket, electric light plant, and powered with a Waukesha gasoline engine. Box 190-SD.

BUCYRUS-ERIE SLIGHTLY USED 22-B Gasoline 45-ft. boom dragline and 1-yd. Page bucket. Like new. Box 352-SD.

FOR SALE OR RENT

One practically new Bucyrus-Erie Model E-2 Dragline, Diesel driven, equipped with 50' boom and 1½-yard Omaha dragline bucket, now located at Shenandoah, Iowa. Box 244-SD.

Small Clamshells and Cranes
Under 2 Yards

MARION MODEL 21 HIGH LIFT STEAM CRANE with 40-foot boom equipment including two drums. Also has 20-foot shovel boom, 15-foot dipper handle and ¾-yard manganese steel dipper. Boiler retubed and machine is in excellent operating condition. Located about 15 miles from Baltimore, Maryland. Price for immediate acceptance, subject to prior sale, f.o.b. present location—$1800. Box 396-SCC.

OSGOOD ONE-YARD GASOLINE combination clamshell-dragline-shovel. Equipped with six cylinder Beaver motor. Overhauled late 1931. Attractively priced. Box 323-SCC.

GENERAL 35-FOOT BOOM CLAMSHELL MACHINE and ½-cubic-yard Lakewood bucket. Equipped with four cylinder Buda gasoline engine. Machine new September 1929. Box 335-SCC.

NORTHWEST MODEL 104, combination 45-foot boom clamshell and dragline. Will handle 1¼ cubic-yard bucket. Also 1¼ cubic-yard Pull shovel attachment. Shop number around 1800. Good condition. Will demonstrate. Priced to sell. Box 297-SCC.

LITTLE GIANT CRANE—Gas—Caterpillar Model C. Type B—¾-yd. bucket. Recently overhauled. Now working. $1,500.

BROWNHOIST CRANE — Gas — Cats. Model 2-C Serial No. 8829. 1-yd. bucket. Good working condition. $1,500.

McMYLER MODEL J. LOCOMOTIVE CRANE—35 Ton Steam. 50 and 75-ft. Boom. 1½ or 2-yd. buckets. New boiler and swinging engine recently installed. A real crane for long reach and heavy work. Thoroughly overhauled condition. $4,500.

Box 346-SCC.

P. & H. MODEL 206 combination clamshell and shovel. Located near Chicago. Good condition. Box 336-SCC.

BUCKEYE CLAMSHELL-CRANE, gasoline driven, caterpillar mounted, equipped with 30-foot boom, ¾-cubic-yard clamshell bucket, fairleads and backfiller scraper. Located in Milwaukee, Wisconsin. Box 371-SCC.

Large Shovels and Draglines
2 Yards and Over

A BARGAIN

All kinds parts for model 300 steam and electric shovels. 6-yard dipper, trucks, dipper sticks, rot. segments, etc., shovels of all sizes.

McCartney Machinery Co.
103 E. Indianola Youngstown, O.

50-B BUCYRUS-ERIE ELECTRIC SHOVEL, equipped with 3-phase A. C. current, 550 volts, 60 cycle and has three motors. New Manganese steel dipper. Located South Carolina. Box 226-LSD.

50-B DIESEL DRAGLINE; equipped with 50-foot boom, electric light plant, mounted on "cats." Located Vincennes, Indiana. Can be seen at any time. New August 1927. Box 78-LSD.

2½-YD. DRAGLINE

Class 220 Page Dragline; 100 H.P. Charter-Horizontal Twin Cylinder engine; 72-foot boom; 2½-cubic-yard Page bucket. Located Northwestern Indiana. Box 200-LSD.

85-C STEAM SHOVEL, on caterpillar mounting, caterpillars in good condition, price $2,500. Located near Hazelton, Pa. Box 163-LSD.

BUCYRUS-ERIE 50-B STEAM SHOVEL, 26-foot boom, 15-foot handles, two-cubic-yard rock dipper. Shop number 9954. Shipped new in 1928. Machine in good operating condition and can be inspected under steam at Eastern Location. Box 397-LSD.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Large Shovels and Draglines
2 Yards and Over
Continued

CLASS 14 STEAM-DRIVEN DRAGLINE. New 1922. Shop number about 3700. Mounted on skids and rollers. Equipped with 60-foot boom, 2-cubic-yard bucket and electric light plant. Located western Iowa. Priced to sell. Box 395-LSD.

50-B STEAM SHOVEL, Number 3946; equipped with 1½-cubic-yard dipper, 26-foot boom, also 1½-cubic-yard dragline bucket with 50-foot boom caterpillar mounted, equipped for burning oil, located at Texarkana, Ark. Price very reasonable. Box 112-LSD.

BUCYRUS-ERIE SHOP REBUILT 100-B STEAM SHOVEL; shop number 4890; 29-foot 6-in. boom; 20-foot handle; three-cubic-yard dipper. Can be inspected at So. Milwaukee, Wis. Priced to sell. Box 187-LSD.

For Sale or Rent

ONE CLASS-14 STEAM DRAGLINE excavator. Number 3402, 70-foot boom, 2-cubic-yard bucket, caterpillar mounted, equipped for burning gas or oil. Priced very reasonable. Located at Grand Prairie, Texas. Box 110-LSD.

68-C BUCYRUS ELECTRICALLY OPERATED SHOVEL, equipped with 2½-yard manganese front dipper, 3 phase, 60-cycle, 440-volt motors, transformers, cable reel and approximately 1400 feet of cable, all in excellent condition. Reasonable price.
Address Box 268-LSD.

6-YD. SHOVEL

BUCYRUS-ERIE 320-B electric shovel, Ward-Leonard control, 3 phase, 60 cycle, 2300 volts, equipped with 6-cubic-yard dipper, 85-foot boom and 58-foot handles. Is in good condition and may be inspected in operation. Reasonably priced. Box 279-LSD.

70-TON STEAM SHOVEL mounted on "cats," caterpillars in good condition. Located near Hazelton, Pa. Box 162-LSD.

225-B OWNERS

You may be interested in a partial Bucyrus-Erie 225-B steam shovel located in Kentucky coal fields as a source of spare parts. No reasonable offer refused. Box 211-LSD.

MONIGHAN STEAM DRAGLINE, with 123-foot boom, 3¼-cubic-yard bucket, mounted on skids and rollers, located southeastern Iowa. Box 367-LSD.

MONIGHAN DRAGLINE MODEL T, 2-cubic-yard 60-foot boom located near Wichita, Kansas, where it is now working. About seven years old. Has recently been thoroughly overhauled. Box 180-LSD.

DIESEL-ELECTRIC DRAGLINE

Class 14 Diesel electric dragline, Shop Number 5079, new fall of 1927 with 70-foot boom, 2-cubic-yard bucket, and with extra 10-foot extension, western location. Box 296-LSD.

50-B STEAM SHOVEL, new March 1927. Shop number about 4950. Has 26-foot boom, 17-foot dipper handle and 2-cubic-yard dipper. Priced to sell. Box 240-LSD.

For Sale or Rent

ONE CLASS-14 STEAM DRAGLINE excavator Number 3327 60-foot boom, 2-cubic-yard bucket, caterpillar mounted, equipped for burning gas or oil. Price very reasonable. Located at Turkey Creek, La. Box 111-LSD.

175-B STEAM SHOVEL No. 4090, equipped with 75-foot boom, 48-foot dipper handle and 3½-cubic-yard dipper. Machine is in very good condition. Oversize boiler. Box 148-LSD.

3-YD. SHOVEL

BUCYRUS 78-C, caterpillar mounted; three-cubic-yard dipper; shop number 3611. Boom rebuilt last year. Equipped with new 103-C boiler and will pass boiler inspection in any state. Shovel is in very good condition and is in operation at present time. Box 326-LSD.

70-C BUCYRUS STEAM SHOVEL on Cats. Complete. In operating condition. Shop number 1712. Also one extra three-yard Manganese dipper. $2,000. Chicago territory. Box 347-LSD.

BUCYRUS 320-B STEAM STRIPPING SHOVEL, shop number 4205, new in 1925, used less than four years. Located at Toronto, Ohio. Box 74-LSD.

BUCYRUS 80-B STEAM SHOVEL, shop number about 3800; 2-cubic-yard dipper; 48-foot boom; 32-foot dipper handle. "Cat" mounted. Priced to sell. F.o.b. cars. Box 255-LSD.

TYPE 175-B ELECTRIC, No. 794 equipped with 87' shovel boom, 48' dipper handle, 3½-yd. bucket, and dragline equipment including 125' boom, and 3½-yd. bucket. This machine was recently reconditioned and is in good operating condition. Present location, Connecticut. Box 263-LSD.

BUCYRUS 70-C, Shop number around 1500. Thoroughly overhauled. Good working condition. Eastern location. Box 299-LSD.

CLASS-24 BUCYRUS-ERIE STEAM DRAGLINE, shop number 912; 115-foot boom, 3½-cubic-yard Page bucket. Florida location. Box 73-LSD.

SHOVEL FRONT END for 175-B Bucyrus-Erie 65-foot boom, 47-foot dipper sticks and 3½-cubic-yard dipper. Located in Ohio. Box 10-LSD.

What Do You Bid On a

70-C STEAM SHOVEL located near Marietta, South Carolina, where it completed a railroad job? Bargain as supplementary shovel or as supply of spare parts.

88-C STEAM SHOVEL located in Kansas. Carefully laid up after completing season's work. 3½-yard dipper. Fine condition. Any reasonable offer accepted. Box 52-LSD.

Miscellaneous Equipment

SMITH 27-E PAVER, gasoline driven caterpillar mounted, bought new late in 1930. Has handled less than 40,000 yards of paving. Priced to sell. Located in Arkansas. Box 312-ME.

DUMP CARS

6—8-yard Western — 36-inch Gauge — 2-way side.

LOCOMOTIVES

1—15-ton, 10x14 — 36-inch Gauge — Vulcan Saddle Tank.
2—21-ton, 11x16 — 36-inch Gauge — Vulcan Saddle Tank.

BOILERS

1—100 h.p. Locomotive Type for 70-C Bucyrus shovel.
1—32 h.p. Locomotive Type Stationary.

Box 181-ME

COMPLETE EQUIPMENT for 2 strip mines, contractors or quarry operations, No. 300 and No. 36 Marion steam shovels, well drills, locomotives, cars, crushers, picking tables, loading booms, cable and button retarders, compressors, motors, transformers, flood and search lights, camp equipment and new repair parts for above. Box 195-ME.

OPPORTUNITY OFFERED

We have a Bucyrus 14 dragline on caterpillars, 87-foot 9 inch boom and two cubic yard bucket in working condition which we wish to sell together with about five years stripping work for same. Box 394-ME.

BUCYRUS-ERIE TYPE B 40-foot clamshell attachment. Will consider any reasonable offer. Box 242-ME.

LOCOMOTIVES

8 **BALDWIN,** 17x24, straight drive standard gauge 45 ton locomotives. 54 inch boilers. Shop numbers from 32,750 to 34,611. Each one has passed State Boiler Inspection yearly. Boilers will stand cold water test of 240 lbs. At present in actual service in Minnesota mine.

2 **BALDWIN** Locomotives, 19x26, standard gauge, 6 wheel switching type, shop numbers 39534 and 39536. Box 152-ME.

4 **LA PLANT-CHOATE,** 6-yard, all-steel, dump wagons. Equipped with wide iron wheels. Price $200.00 each. Chicago territory. Box 349-ME.

EVERY ONE A BARGAIN

1—**STEAM ENGINE**—12½"x16" link reverse for Railroad Shovel.

1—**"LITTLE TUGGER" STEAM HOIST ENGINE** No. 1-H5—2½ H. P. (Ingersoll Rand—Form 4333 Page 15).

17—**BRAND NEW 75 H.P. 7"x8½" STROKE. 4 CYLINDER ATLAS DIESEL ENGINES.** Non-reversible. Complete with auxiliary air compressor and fuel tank. Will sell without auxiliary compressor and fuel tank.

1—**USED 45 H.P. 6½"x8½" NON-REVERSIBLE ATLAS DIESEL ENGINE.**

3—**4½"x5" REVERSIBLE STEAM ENGINES**—20.8 H.P. at 400 RPM. Normal running speed at 100 pound steam pressure.

1—**4¾"x5" REVERSIBLE STEAM ENGINE**—23.2 H. P. at 400 RPM Normal running speed at 100 pound steam pressure.

2—**5"x5" REVERSIBLE STEAM ENGINES**—25.6 H. P. at 400 RPM. Normal running speed at 100 pound steam pressure.

ADDRESS BOX 375-ME

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Miscellaneous Equipment
Continued

1—REBUILT SPUR GEAR CAT. MOUNTING, suitable for application Type B or B-2 Machines. Factory guarantee.

2—LOCOMOTIVE BOILERS 54"x11'x3" 92 H.P.—Under forced draft. 125 pounds working pressure. 465 square feet heating surface. Heavily built for steam shovel service.

3—LOCOMOTIVE BOILERS 44"x17' 75 H. P. Under forced draft. 125 pounds working pressure, 393 sq. ft. heating surface. Heavily built for Shovel service.

1—PAGE "C" 1-CUBIC-YARD DRAGLINE BUCKET.

Box 332-ME.

WANTED

Used electric welding outfit, 200 ampere capacity. Must be in good condition. Address Box 379-ME.

KIESSLER CLAMSHELL BUCKET, One 1½-cubic-yard; used only 90 days. Price $275.00.

Box 298-ME.

For Sale or Rent

Two 40-ton, 6-wheel switchers. Recently overhauled and rebuilt. Two 50-ton, 6-wheel switchers. In excellent condition. Location Chicago. Box 306-ME.

COMPLETE CONTRACTORS EQUIPMENT

Offered for sale by Southern contractor. Priced to sell.

7—Railroad Type Steam Shovels 2½ to 5 yd.
3—Full Revolving Shovels ¾ yd.
1—Gasoline Clamshell Crane ½ yd.
2—Jordan Spreaders.
2—Locomotives, 26 Ton, American Saddle Tank
32—12-yd. Western Heavy Duty Dump Cars
3—Camp Cars
1—Flat Car
2—1-bag Gasoline Concrete Mixers
Pumps, Boilers, Jacks and Other Tools

For further particulars, Address Box 138-ME.

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Excavating Engineer

BUCYRUS-ERIE COMPANY

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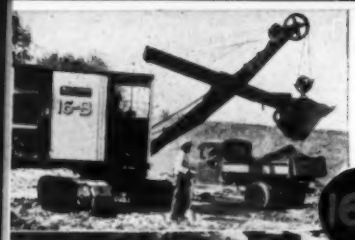

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